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Data-based decision making for education planning: strategies for principal success

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ABSTRACT

Data-based planning occupies a very important role in determining the success of schools or educational institutions in determining the right strategy to improve the quality of the education provided. Decision-making that is not in favor of student learning interests still often occurs in schools or educational institutions. This study aims to examine the forms and patterns of decision-making and formulate concrete efforts to design data-based plans in schools that are in favor of increasing student learning outcomes and achievements. This study took data from 20 schools spread across Jambi Province. Participants consisted of school principals, teachers, school committees, and students. The sample used was taken randomly. The process of collecting data through interviews, observation, and document review. The results of this study indicate that planning in schools is based on fulfilling administrative needs and accountability, the data collected has not been used as a basis for making decisions to improve student learning processes and outcomes. In general, there are several stages of decision-making that are carried out, namely: identification of problems or issues faced, data collection, evaluation of alternatives, selection of alternatives, and implementation of decisions. The challenges of cultivating data-based planning at the school level are data availability, human resource competence, support from related parties, and organizational culture.



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Introduction

Data-based planning is a method that has been used in various fields for a long time (Provost & Fawcett, 2013). However, the use of data for intensive planning only started to become popular at the end of the 20th century, especially after the information technology revolution that made it easy to store, analyze, and exchange data. Initially, data-driven planning was only used by schools or educational institutions that had sufficient resources to collect and analyze data. However, along with increasing access to information technology, data-based planning is starting to be widely used by schools and educational institutions around the world (Mei Kuin Lai & Kim Schildkamp, 2013).

Data-based planning is also starting to be recognized as an effective method for improving the quality of education, especially after several studies showing that the use of data can assist teachers and schools in determining appropriate steps to improve student achievement (Hoogland et al., 2016; Agrawal et al., 2016; Abdul Rahman Suleman et al., 2022; Sri Mundaryati, 2022). In addition, data-based planning has also begun to be used by the government and higher education institutions to increase the efficiency and effectiveness of education (Agus Widodo & Andri Tri Kuncoro, 2018; Purnama Ningsi et al., 2022). As such, data-driven planning has become an important part of education systems around the world.

Data-based planning is a method for collecting, analyzing, and using data to make the right decisions in the planning process. In the world of education, data-based planning can be used to assist schools or educational

institutions in determining the right strategy to improve the quality of the education provided (Abdul Rahman Suleman et al., 2022; Mei Kuin Lai & Kim Schildkamp, 2013). The effective use of data has resulted in improvements in student learning (Schildkamp et al., 2013).

Data-driven decision making is a process by which educators and educational leaders use data to formulate their decisions about various aspects of educational planning, such as curriculum development, teaching strategies, and resource allocation. The goal of this approach is to improve learning and student learning outcomes by making needs-based, data-driven decisions (Huffman & Kalnin, 2003; Mei Kuin Lai & Kim Schildkamp, 2013). DBDM (Data-Based Decision Making) or data-based decision making can be defined as “systematically analyzing existing data sources in schools, using the results of data analysis to determine innovations in teaching, curriculum, and improving school performance and evaluating innovations that have been made” (Schildkamp & Kuiper, 2010).

To start data-based planning, it is first necessary to determine the goals and objectives to be achieved (Kippers, 2014). After that, relevant data must be collected and analyzed to determine what needs to be done to achieve the goal (Prenger & Schildkamp, 2018). Data can come from a variety of sources, such as test results, school self-evaluation results, accreditation results, and recommendations, student progress reports, and teacher, parent, and student satisfaction surveys.

When analyzing data, it is necessary to ensure that the data used is valid and reliable, that is, data that is accurate and reliable (Breiter & Ligh, 2006) and important to support accurate data collection (Madyan et al., 2022) and employ efficient cooperative data team construction (Huffman & Kalnin, 2003; Schildkamp et al., 2016; Wayman et al., 2017), so that the information gathered is accurate and dependable. After the data has been analyzed, the results of the analysis can be used to develop teaching strategies that are in line with student needs, increase teacher effectiveness, or improve school facilities.

Data-based planning also requires continuous evaluation to ensure that the strategy developed is effective and in accordance with the stated objectives (Ahmed, 2015; Geel et al., 2015; Schildkamp et al., 2019a; Young, 2017). Thus, data-based planning can assist schools or other educational institutions in improving the quality of education and learning provided to students.

Schildkamp et al., (2019b) describe their research results pointing to five key building blocks for school leaders looking to build effective data teams in their schools: (1) establishing visions, norms and goals (e.g. discussing visions, norms and goals with teachers); (2) providing individual support (for example, providing emotional support); (3) intellectual stimulation (e.g. sharing knowledge and providing autonomy); (4) creating a climate for data use (e.g. creating a safe climate that focuses on improvement rather than accountability, and involves discussing data with teachers); and (5) building networks to connect different parts of the school organization (for example, brokering knowledge and creating networks committed to data use).

A number of studies above provide us with an understanding that all of the above expectations have not been fully implemented at the school level in this country. Preliminary studies conducted by researchers indicate that most of the data in schools is only used for accountability purposes (Abdusyakur & Poortman, 2019; Agasisti & Bowers, 2017). The factor of a school principal as a leader and decision maker at the school level has an important influence on the use of data to improve the quality of teaching and learning (Asvio et al., 2019; Rulitawati et al., 2021), besides the data literacy factor (Schildkamp, 2019). Data-driven decision-making can improve student learning. The desired effect of improving student learning can only be realized if data-driven decision-making is successfully implemented. Several prerequisites for the successful use of data in the classroom that are supported by a substantial evidence base were identified, including teacher collaboration around data use, data literacy, and leadership (Hoogland et al., 2016b). But this role is still far from reality on the ground.

In fact, studies show that those who generate education data are often far removed from those who make important decisions about education policies, programs, and investments. With limited knowledge about what is used and needed by decision-makers, the decisions taken will be very far from the expected needs (Custer et al., 2018). Even research that has been conducted in the field of learning analytics in Austria, Denmark, Finland, Norway, Germany, Spain, and Sweden concluded that learning analytic research at the pre-university level to a high level has been neglected. In the same vein, learning analytics has not received sufficient focus from national and European bodies, yet data is needed to take steps toward developing data-driven education. (Nouri et al., 2020).

Based on the above study it is clear that the data has not been used as a basis for making decisions and has not been used as a basis for planning to improve the quality of learning and education in schools. School leaders only use data to the extent that they need reports and school accountability. And the school does not yet have a data-based short-term or long-term work plan. Thus, schools do not have significant changes from year to year, in terms of the quality of education services, learning, and facilities owned by schools.

Therefore, the efforts of various parties are needed, one of which is this research which aims to look at the patterns and stages of decision-making carried out by school principals and what are the challenges in cultivating data-based planning at the school level. An understanding of the patterns and forms of decision-making carried out by school principals can be a basis for formulating concrete efforts to design data-based plans in schools that are in favor of increasing student learning outcomes and achievements.

Method

This research was conducted at 20 schools in Jambi Province spread over four districts, namely Kerinci Regency, Sarolangun Regency, Merangin Regency and Tebo Regency. Several schools were used to obtain data, namely: Public Elementary School (SDN) 214IV Jambi, SDN 183IV Jambi, SDN 146IV Jambi, SD Attaufiq Jambi, SDN 09/VI Nalo Gedang, SDN 13/VI Kampung Tengah, SDN No. 18VI Dusun Tuo I, SDN 165/VIII Sumber Arum, SDN 024VII Batu Ampar, SDN 032VII Mandiangin Tuo, SDN 040 VII Bernai I, SDN 028 VII Lubuk Jering, SD Islam Terpadu (IT) Permata Hati, SDN 063VII Dusun Sarolangun, SDN107VII Panti, SDN 169III Mukai Mudik, SDN 191III Koto Cayo, SDN 203III Cupak, SDN 94III Siulak Deras, dan SDN 96III Bunga Tanjung. This research is qualitative research with a phenomenological approach where primary data (John W. Creswell, 2014) was collected from the responses of school principals, teachers, school committees, and students. Informants were selected using a random sampling approach with certain criteria. Therefore, informants are parties involved and have a direct impact on the research topic.

This study was conducted in several stages. The first stage is to formulate the main research questions related to how schools collect data and utilize school data in preparing future plans. Second, data collection was carried out through unstructured in-depth interviews. This interview is conducted naturally and does not follow a strict structure. The indicators of the success strategy used by the school principal consist of: 1) identifying opportunities or problems; 2) developing alternatives; 3) evaluating alternatives; 4) using information/data; and 5) choosing an alternative. Meanwhile, the decision-making indicators used include: 1) setting specific goals and targets; 2) problem identification and definition; 3) setting priorities; 4) looking for causes; 5) development of alternative solutions; 6) evaluation of alternative solutions; 7) choose a solution; 8) implementation; and 9) follow-up. The interview approach used the judgment sampling method, in which one informant gave instructions regarding the suitability of the other informant. This method is also used to obtain validity between the answers of one informant and another. During the interview, reflection activities were carried out continuously. This study uses qualitative analysis (Kristiawan & Asvio, 2018; Mindani et al., 2022) with a thematic analysis approach through several stages, namely data collection, reduction, interpretation, and display. Thematic analysis requires more engagement and interpretation from researchers.

Results and Discussion

Strategies for Collecting and Analyzing Educational Data

To make data-driven decisions, educators must first collect the necessary data. This process can involve collecting data from a variety of sources, including student records, teacher evaluations, and external data sources. Once the data is collected, it must then be analyzed to identify patterns, trends and correlations that can be used to formulate decisions. This analysis can involve a variety of techniques, including descriptive statistics, predictive analysis, and application-based systems.

The following are some strategies that can be used by school principals to collect and analyze Education data, namely: Surveys: Principals can conduct surveys of students, teachers, parents, and/or other personnel to collect data on their needs, expectations, and opinions about school. Surveys can be conducted online or offline using questionnaires or interviews. Observation: The principal can make observations of teaching and learning activities in class or other activities at school to collect data on the performance of teachers and students, as well as the facilities available at school. Document analysis: Principals can analyze documents such as student progress reports, financial reports, and evaluation reports to collect data on student performance and school finances. Focus group discussions: Principals can hold focus group discussions with students, teachers, parents, and/or other personnel to gather data about their needs, expectations, and opinions about the school. Statistical analysis of the data: After collecting the data, the principal can analyze it using data analysis techniques such as descriptive statistics or regression analysis to obtain more detailed information about the performance of students and the school as a whole (van Geel et al., 2017; Vanlommel et al., 2017)

Facts on the ground in the collection and analysis of educational data, school principals are more dominant in using document analysis in the form of internal document reports submitted by teachers and education staff, such

as teacher and student attendance reports, reports on the condition of facilities and infrastructure, school self-evaluation reports, student learning progress reports, school financial reports. And school financial reports have a portion more attention by schools because they involve school accountability and responsibility. In addition, school principals also use external document reports such as accreditation reports carried out by accreditation bodies.

In document analysis, there are several problems faced by school principals in analyzing school documents, including: Documents that are not well organized: documents that are not properly organized can make it difficult for school principals to find the information needed. Inconsistent documents: documents that are inconsistent from one year to another can make it difficult for school principals to compare and analyze data effectively. Inaccurate documents: inaccurate documents can lead to unreliable analysis results. Incomplete documents: incomplete documents can cause the principal to have difficulty obtaining sufficient information to make the right decision. These challenges or obstacles occur because the data collection process is carried out unstructured it affects the validity and reliability of the data.

To overcome these problems, school principals can ensure that school documents are well organized, consistent from year to year, accurate, and complete so that they are easily accessed and analyzed effectively. Principals can also work closely with administrative staff to ensure that school documents are constantly updated and properly maintained. It is important to note that school principals must constantly collect and analyze educational data to make informed decisions and manage schools effectively.

In addition, school principals also use an observational approach in collecting and analyzing educational data, namely by observing student activities, the learning process and observing school facilities, however, the school has very few records of the results of these observations. Observations tend to be unplanned, because from the data collected it is confirmed that the observations are carried out in daily processes without using planned benchmarks and there is no written report.

Regarding the implementation of observations, there are several challenges faced when the principal observes teaching and learning activities. Among them are: Lack of time, observation of teaching and learning activities requires sufficient time, but school principals are often too busy with other matters so they do not have enough time to make regular observations. Lack of observational ability, the principal feels that he does not have good observation skills so he cannot identify problems that occur during teaching and learning activities. Lack of communication, the principal needs to provide sufficient feedback or provide appropriate recommendations to the teacher after making observations.

In addition, it was confirmed that school principals had not consistently collaborated with teachers, parents and other personnel to collect sufficient and accurate data, and to obtain assistance from data analysis experts to analyze it properly.

Using Data-Based Decision-Making in Education Planning

Data-driven decision-making can be used to formulate various educational planning processes. It can be used to identify areas of improvement, develop strategies to address those areas, and evaluate the effectiveness of those strategies. Data-driven decision-making can also be used to inform decision-making processes around budgeting, curriculum development and resource allocation. Finally, data-driven decision-making can be used to develop long-term plans and strategies to ensure the success of educational institutions.

There are several stages of decision-making that can be carried out by a leader or by the principal, namely: Identifying the problem or issue being faced, this stage is the initial stage where the principal identifies the problem or issue being faced by the school. Investigation and data collection, after the problem or issue is identified, the principal then conducts an investigation and collects relevant, valid, and reliable data to find out more about the problem. Alternative assessment, after collecting relevant data, the principal then evaluates the various alternatives available to solve the problem or deal with the issue. Selection of alternatives, after evaluating the various available alternatives, the principal then chooses the one that is considered the most appropriate alternative to solving the problem or addressing the issue. Implementation of the decision, after choosing the right alternative, the principal then takes the necessary actions to process and manage the problem or issue. Evaluation of decisions, after decisions are taken and implemented, the principal then evaluates to determine whether the decisions taken have been effective in solving problems or dealing with these issues (M Nurzen S et al., 2020)

The pattern and stage of decision-making by the principal may vary depending on the situation and context. However, in general, from the data analysis carried out there are several stages of decision making that are commonly carried out by school principals, namely: Making decisions without identifying the problem correctly, school principals sometimes make decisions too quickly without first identifying the problems or issues that are

actually faced by school principals. school. This can lead to decisions that are not correct and not effective in dealing with the problem. Making decisions without conducting sufficient investigation and data collection, school principals are sometimes too hasty in making decisions without conducting sufficient investigation and data collection first. This can lead to inappropriate decisions because they are not based on accurate and complete data. Making decisions without evaluating the available alternatives, the principal rushes into making decisions without evaluating the available alternatives first. This can lead to an incorrect decision because it does not consider all available options. Making decisions without considering the consequences, principals are too focused on short-term goals and do not consider the long-term consequences of decisions taken. This can lead to inappropriate decisions because they do not consider the impact on the school as a whole. Making decisions without involving related parties, principals make decisions without involving teachers, students, parents, and other related personnel. In fact, it was found that in some conditions the principal made decisions personally without involving other parties. This can lead to inappropriate decisions because they do not consider the perspectives and needs of these parties.

The above conditions are exacerbated by the apathy and lack of understanding of some interested parties about the importance of data-based planning and decision-making in schools, such as parents or school committees who completely hand over school affairs to the school without providing good oversight, even tending to just follow what decisions made by the school. And teachers who don't respond when the principal makes a decision without involving the teacher and the committee. So that this practice without us realizing it goes on and on and in one condition it is very possible that a practice like this is considered correct.

How to Implement a Data-Driven Decision-Making Process in Education

In order to implement data-driven decision-making processes in education, educators must first develop a sound understanding of the data available and the processes required to collect and analyze that data. Educators must also develop a data collection and analysis plan, and outline the steps to be taken to collect and analyze data, so that the data collected is valid and reliable data.

Once a data collection and analysis plan is in place, educators must then determine the best method for collecting and analyzing data. This can use surveys, interviews, or other methods. Finally, educators should develop a data-driven decision-making process that outlines the steps to be taken to make a data-driven decision (Mandinach & Schildkamp, 2020; Wohlstetter et al., 2008)

To implement a data-based decision-making process in education, school principals can follow the following steps: Identify the problems or issues faced, the first stage is to clearly identify the problems or issues faced by the school. This can be done through surveys, observations or consultations with teachers, students, parents and other personnel. Investigation and data collection, after a problem or issue is identified, the principal then conducts an investigation and collects relevant data to find out more about the problem. This can be done by analyzing school documents, conducting surveys, or conducting focus group discussions. Alternative assessment, after collecting relevant data, the principal then evaluates the various alternatives available to solve the problem or deal with the issue. This can be done by comparing the advantages and disadvantages of each alternative and considering the impact on the school as a whole. Selection of alternatives, after evaluating the various available alternatives, the principal then chooses the one that is considered the most appropriate alternative to solving the problem or addressing the issue. Implementation of the decision, after choosing the right alternative, the principal then takes the necessary actions to manage and manage the problem or issue. Evaluation of decisions, after decisions are taken and implemented, the principal then evaluates to determine whether the decisions taken have been effective in solving problems or dealing with these issues. If not, the principal can identify problems that arise and make more appropriate decisions to solve these problems.

While data-driven decision-making can provide educational institutions with many benefits, there are also some challenges associated with its implementation. These challenges include educators' lack of data literacy, lack of access to data, difficulties in collecting and analyzing data, and the costs and time associated with data collection and analysis.

In addition, there may be a lack of agreement among stakeholders on how the data should be used and interpreted. Finally, there is a lack of trust in data or data-driven decision-making processes, which can make it difficult to implement.

Conclusion

The pattern and stage of decision-making by the principal may vary depending on the situation and context. However, in general, there are several decision-making stages that are commonly carried out by school principals, namely: Identification of problems or issues faced, this stage is the initial stage where the principal identifies problems or issues faced by the school. Investigation and data collection, after a problem or issue is identified, the principal then conducts an investigation and collects relevant data to find out more about the problem. Alternative assessment, after collecting relevant data, the principal then evaluates the various alternatives available to solve the problem or deal with the issue. Selection of alternatives, after evaluating the various available alternatives, the principal then chooses the one that is considered the most appropriate alternative to solving the problem or addressing the issue. Implementation of the decision, after choosing the right alternative, the principal then takes the necessary actions to process and manage the problem or issue. The challenges in cultivating data-based planning at the school level include: Availability of data. One of the main challenges in cultivating data-based planning in schools is the availability of sufficient and accurate data. Competence of human resources, school principals, and school staff must have competence in conducting data analysis and developing action plans in accordance with the data obtained. Support from related parties, data-based planning must be supported by interested parties, such as the government, teachers, as well as parents, and the surrounding community. Organizational Culture, an organizational culture that is less supportive of implementing data-based planning can be a challenge in itself. Data-based planning requires the active involvement of all school members in collecting data, conducting analysis, and making decisions.

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