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The Application of Fishbone Diagram Analisis to Improve School Quality

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Abstract

With the enactment of the National Education Standards (NES), the measurement of the school quality was clear; NES became a reference for school development program to improve the school quality. However, the form of the program that exist still in problematic, so that a good proposal need to be prepared. In the real condition, the school shows, although they already have prepared school improvement program, but it has not been based on scientific studies and yet profound; many principals have constraints, because of the low quality of the program implementation. Thus the assistance for the school is needed in order to develop a school improvement program based on a model that proved effective and efficient. The research problems are: 1) What steps are to take in a program development aimed at improving the quality of school using a fishbone analysis? 2) Is the program model using fishbone analysis effective and efficient in meeting the school's needs to improve its quality? This is research and developmental which comprises 3 phases, namely Preliminary Study, Model Development, and Evaluation/Model Testing. The qualitative data come from the input of management experts and the result of interviews/FGD with stakeholders. The quantitative data are obtained from the assessment of management experts on the product draft, the observation sheets for the field study on the standards of education, and the try out. Data analisis on the validation result uses a descriptive analysis technique. Data from the questionnaire are analyzed by descriptive statistical technique. The results are: 1) the developmental steps in the school quality improvement program fish bone analysis have gone through 6 phases, 2) the research product using fish bone diagram has proved to be simple, applicable, important, controllable, as well as adaptable. Furthermore, it is communicable, so that it has been effective and efficient for the school's needs to improve its educational quality.

Keywords: planning model, school quality, cause root analisis

A. Introduction

A school vision is a moral imagination which becomes a basis or reference in determining objectives or expected future state of the school. The school vision becomes the basis or reference in making statements of mission, objectives, goal for the school program as well as a future direction for the development of the school. Simply put, vision is a future profile, a future dream to maintain the school's survival and its development (Naap, 2007).

A mission is vision's breakdown in the form of statements for tasks, obligations, and action plans which become directions to make vision realized. A school vision, therefore, is a group of duties which must be carried out by the school. As a note, as an action to realize mission, mission may comprise aspects, such as teaching-learning, development of religious morality, school climate, school management, and the like (Naap, 2007).

Starting from vision and mission, the school then formulates objectives. The school objectives are the breakdown of the school vision and mission, or, a step to realise the school vision which is already stated. If vision and mission are seemingly a long range achievement, the school objective is for a middle range achievement (3–5 years). There is no exact time frame, for the purposes of education is required in order to make details more easily. If vision is a future, ideal profile, then the objectives to be achieved in 4 years' time may not have been completed. In other words, objectives are the further breakdown of vision (Naap, 2007).

Identification of real challenges of a school contains a general situation of challenges faced by the school in its effort to realize its vision, mission, and objectives to be achieved by the school. At this phase, the school makes an analisis of the output which results in an identification of real challenges faced by the school. Challenges are difference between the school output and the ideal expected in the future. The size of the difference tells about the size of challenges or leaps. Generally speaking, the real challenges faced by the school originate from the school output, which can be divided into 4 categories, namely, quality, productivity, effectivity, and efficiency. The school targets or objectives contain those which will be achieved including the school needs. A target is an objective which is stated by taking into account real challenges faced by the school. Although the target is formulated on the basis of real challenges faced by the school, its statement must constantly refer to the school vision, mission, and the school objectives. The situational goal of objective of the school is also often called a short range objective (Naap, 2007).

As soon as the target is determined, the next step is the identification of function in order to achieve the target. This step, as an example, can be taken as a preliminary phase to make a SWOT analysis. It needs accuracy and care in deciding functions needed to achieve the target already determined. Alternative steps in solving problems include those which will be taken to achieve the school's vision, mission, and objectives in its effort to make use of potencies of the school together with the steps taken in overcoming weaknesses and threats on the school (Lestari, 2011).

With the imposition of the Indonesian Education National Standard (SNPI), to measure the school quality has been clear; SNPI will function as a reference for school development to improve its quality. Whatever form the school's quality improvement

takes in, it should be programmed quite well. This good program will make it easy to carry out. The program should also be prepared in a good proposal.

A school operational program contains vision, mission, and objectives of the school, identification of real challenges faced by the school, targets/objectives, identification of target functions, SWOT analisis which contains a short analysis in the level of function readiness, steps in problem solutions, quality improvement plans and program, and the school budget (RAPBS) (Naap, 2007).

In a real school condition, even though the school has made its improvement program, such a program has not been based on a deep scientific study; many principals having problems in developing a program for quality improvement of their schools. Few of them have undertaken a SWOT analysis, but they face a problem in deciding to use an appropriate strategy. A direct result of this low quality program should be a poor achievement of objectives in its implementation. Roca (2005) in *Collective Leadership Works,* experienced using the fishbone process with great success to help the group formulate thorough plans of action. It is necessary, therefore, that there should be a useful model for a school to have assistance in its effort to develop its quality improvement program.

Research Problems

1. What steps should be taken to develop a quality improvement program by using fish bone analysis?
2. Is the quality improvement program using fish bone analysis effective and efficient in meeting the school's needs in its effort to improve its quality?

B. Literature Review

Cause and Effect diagram or Fishbone diagram is a graphic technique and is a good tool to find and significantly analyze affecting factors in identifying the characteristics of work output quality (San, Tjitro, & Santoso, 2003). This fishbone diagram is known as a cause and effect diagram. Why is it that this Ishikawa's diagram has been called "fish bone"? Well, when observed the diagram (see diagram 1), the fishbone, its form has a similarity to a fish, which has a head (as an effect) and a body in the form of bones, illustrated as causes of known problems (Tiann, 2012). Root Cause is the deepest underlying cause, or causes, of positive or negative symptoms within any process that, if dissolved, would result in elimination, or substantial reduction, of the symptom (Preuss, 2003). Deepest—this means that we really have to dig deep to find most roots. They usually are not the most immediate, obvious, or proximate causes. Often, they are three, four, or five layers down into the system. Cause or causes—School systems are social systems. They are far more complex than either mechanical or biological systems. For this reason, it is often impossible to isolate a single root cause, and often it is possible to identify several causes that in combination bring about a symptom. The good news is that often, by dissolving any one of the multiple root causes, the symptoms can be reduced or even eliminated. Positive or negative—Our successes, as well as our failures, have root causes. By studying the roots for our successes, we may find strategies that can be applied to improving all of our processes. Symptoms—In dealing with problems, symptoms are found at the surface. They are the —red flag that draws attention to the issue. A symptom is usually a noticeable gap

between expectations and reality. Process—All work is process. A simple process has a minimum of three elements: a) input, b) added value, and c) output. Dissolve—We have to concentrate on dissolving the root rather than —fixing the symptom with a patch. Once the root is dissolved, the symptom will go away of its own accord. Patches just add complexity and cost to the system. Some people think that much of what we do in school is patching.

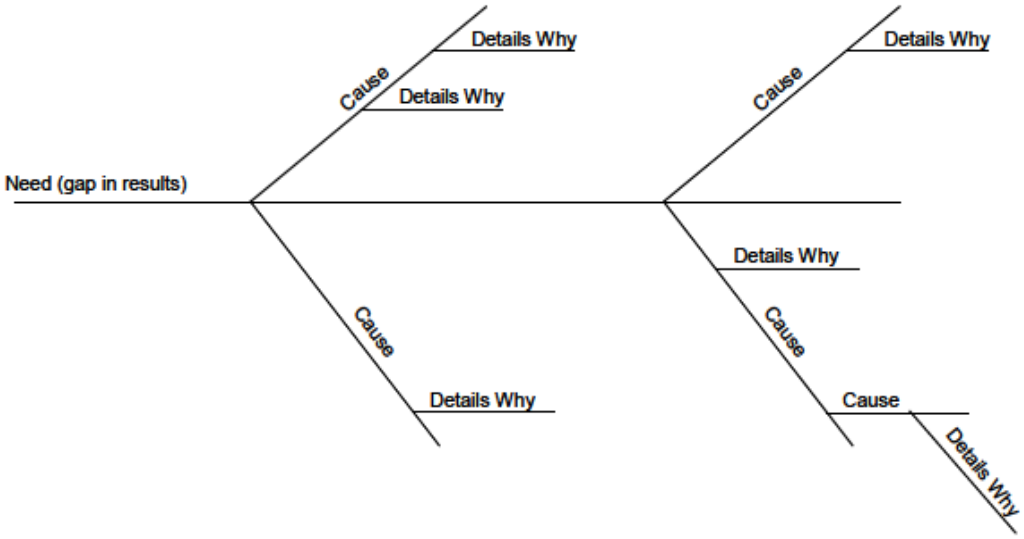

Diagram 1
Fishbone Diagram
(http://siteresources.worldbank.org/WBI/Resources/)

Root Causes can be found at any one of the following levels: 1) Incident or procedural level: Example: A fight in the cafeteria, fifth period on Wednesday: the student, the test, the teacher, the incident. 2) Programmatic level: Example: There are always fights in the cafeteria, every day, at every period: instructional, processes, materials, setting, time, alignment, grouping, scheduling, training and staff, development, administrative, procedures, curriculum, assessment. 3) Systemic level - Example: There are fights everywhere in school; leadership, mission, vision, priorities, morale, planning, budget, policies, values/beliefs, organizational, structure allocation of staff, culture, facilities, technology, competencies, collaboration, evaluation, history, capacity. External level - Example: The whole community is fighting: family, community, gangs, wealth/poverty, health, partnerships and supporting agencies, the media, youth culture.

When is a Cause a Root Cause? In complex social systems, such as schools, it may be difficult, if not impossible, to identify a single, specific, root cause. Often, there are clusters of causal factors that each contribute to the problem. Sometimes, dissolution of any one of the casual factors is sufficient to substantially reduce or totally eliminate the problem. The following concepts provide some direction in identifying root causes or clusters of causal factors. Ammerman has identified three criteria to determine if each identified cause is a root cause or if it is a contributing cause. They

are: (1). Would the problem have occurred if the cause had not been present? If no, then it is a root cause. If yes, then it is a contributing cause.
(2). Will the problem reoccur as the result of the same cause if the cause is corrected or dissolved? If no, then it is a root cause. If yes, then it is a contributing cause. (3). Will correction or dissolution of the cause lead to similar events? If no, then it is a root cause. If yes, then it is a contributing cause. Other indicators that you have found the root cause are: You run into a dead end asking what caused the proposed root cause. Everyone agrees that this is a root cause. The cause is logical, makes sense, and provides clarity to the problem. The cause is something that you can influence and control. If the cause is dissolved, there is realistic hope that the problem can be reduced or prevented in the future.

School improvement teams and others using root cause analysis often wonder when to stop seeking cause and make the decision that sufficient data and effort have been used to arrive at a reasonable root. This is often a judgment call that will improve with experience. Often, the lack of data and the pressures of time frustrate the effort and force it to halt at a level below the surface symptom, but perhaps not as deep as must it ultimately go. In my view, this is the reality of life in a less-than-perfect world. Using the above guides and common sense, however, teams can usually arrive at a proximate area of cause or causes that if dissolved, or reduced, will remedy or reduce the symptom. Teams, however, should not allow timidity or fear to block deeper discovery of issues that may be related to culture or deeper organizational elements.

The causing factors may be raw material, machinery, manpower, and method. All that are related to raw material, machinery, manpower, and method "at present" are written out and analyzed to find which suspected factors indicate a "deviation" and have potential to become a problem. Each category has causes to be explained through a brainstorming session (Kusnadi, 2011).

Scarvada (2004) says that the fishbone diagram can be enlarged into a cause-and-effect diagram. This extension of fishbone diagram can be done through a questioning technique "How come it's up to five whys?" (Pande & Holpp, 2001). Thus, by identifying the causes of the effect, it is hoped that the result of the production process can be improved by changing the controlled factor of a process. This diagram is also useful to identification of causes of a potential problem. A cause-and-effect diagram focuses on emphasizing a problem or a symptom of a problem. This diagram can also show the causes of a problem by connecting them into one group.

Fishbone diagrams are used to identify and systematically list the different root causes that can be attributed to a problem. Thus, these diagrams help to determine which of several causes has the greatest effect. The main application of these diagrams is the dispersion analysis. In dispersion analysis, each major cause is thoroughly analyzed by investigating the sub causes and their impact on quality characteristics. The Fishbone diagram helps to analyze the reasons for any variability or dispersion (Prasad, 2012). Cause-and-effect fishbone diagrams focus on the problem emphasized or the symptom which becomes root causes. By identifying a real problem and finding a root cause, an alternative action plan can be formulated or identified which in turn becomes a way out in improving the quality of education. Further, the alternatives…. are analyzed on the basis of particular criteria, qualitatively or quantitatively. Lastly, the best

alternative is chosen on the basis of particular criteria and priority, and finally a decision can be taken.

Why Root Cause Analysis (RCA) becomes important? 1) eliminates unfounded opinion, prejudice, and organizational myth, 2) reduces false starts, patching of symptoms, and waste of scarce resources, 3) converts data to information, knowledge, understanding, and wisdom, 4) improves data-based decision making (Preuss, 2003; CityProcessManagement, 2008). The advantage of Fishbone diagram is that it can break down each identified problem and everybody involved can contribute suggestions which may be the cause of the problem. The fishbone diagram is both a tool and a technique to identify a solution to a problem creatively for the improvement of educational quality. The root cause analysis has an important role in educational innovation in deciding further corrective and innovative policies. A symptom, phenomenon, gap, or disharmony which exists in the process of education, or any actual problem arising both theoretically and practically, in macro or micro circumstances, can be analyzed by this diagram (Dahari, 2013).

There are three basic concepts distinguishing in improving quality control, quality assurance and total quality. Quality control historically is the oldest quality concept. Its activity involves detection and elimination of failing or out-of-standard products. Its aim is only to accept successful products and refuse failing ones. In the area of education, quality control is implemented by executing summative testing and final examination. The result of the examination can be used to account for the quality control (Rahayu, 2015).

According to the National Education Department (Departemen Pendidikan Nasional, 2007), educational quality control is a series of inter-related processes to collect, analyze, and report data on the educational program or activities in reaching quality of education. The process of quality assurance starts with identifying achievement aspect and improvement priority as well as data supply as a basis for planning and decision making and help build a culture of sustainable quality improvement. The achievement of quality education in elementary and middle education is studied on the basis of eight national standards for education from the Body of National Education Standards /BSNP (Harun, 2014). Quality assurance and improvement in the elementary and middle education in Indonesia are related to three main aspects, namely: (1) study of educational quality, (2) analysis and report of educational quality, and (3) improvement of quality and growing the culture of continuous quality improvement. Especially for the first aspect, it is simply meant that in the study of educational aspect there need to be mapping and determining steps for the achievement of the quality. One of the activities in mapping is done through the School Self-Evaluation (EDS) and other instruments which can add on information about the profile of the school. The activity in determining steps for quality achievement is a systematic, rasional, and measurable plan, formulated by the school to achieve quality education (Harun, 2014).

A reference for quality used in the achievement in the school level is the National Standard of Education (SNP) and other standards approved by the community group, i.e, the standard which is put by the school and or another referential institution. Other standards agreed by the community group is used after

the National Standards are fulfilled by the school according to its special stream, level, and type of education (Harun, 2014).

A minimum target of school development that contained in every plan of school development must use the standards for educational operation in effect nationally (Hastuti, 2013). The Government Regulation No. 19, 2005 on National Standard of Education is a detailed stipulation on national standards of education as said in the Law of National System of Education No. 20, 2003. The government regulation determines the direction of national education reform in order to achieve the vision, mission, and objectives of the national education. There are eight standards: Standard of Content, Standard of Process, Standard of Graduate Competence, Standard of Educator and Teacher Competence, Standard of Means and Infra-structure, Standard of Management, Standard of Finance, and Standard of Assessment.

Plans of Operation which the school makes comprise Middle-range Plan (4 years) and Annual Plan. Plans of Operation of Elementary and Middle Education must be agreed upon in the meeting of education committee after attending to considerations of the School Committee. School planning is important to make in order to give direction and guide to educators in their effort to make changes or achieve better objectives (e.g. improvement, development) with the least risks and minimal future uncertainty. School planning is a process of formulating a picture of future educational activities to achieve stipulated changes and educational objectives (Masrifah, 2014).

Daft (1988) says, "When planning is done well, the other management functions can be done well." Planning is essentially an effort to determine where an organization is to go in the future and how to arrive at the destination. In other words, planning means defining a destination to be achieved by an organization, and making decisions on duties and utility of resources needed to achieve the destination. A plan, on the other hand, is the result of a planning process in the form of a blueprint of resource allocation needed, schedule, and other activities in order to achieve objectives (Sarumaha, 2013). Further, Clark County School District (2012) mentions about steps in the school planning process using the root cause analysis, which is illustrated as follows.

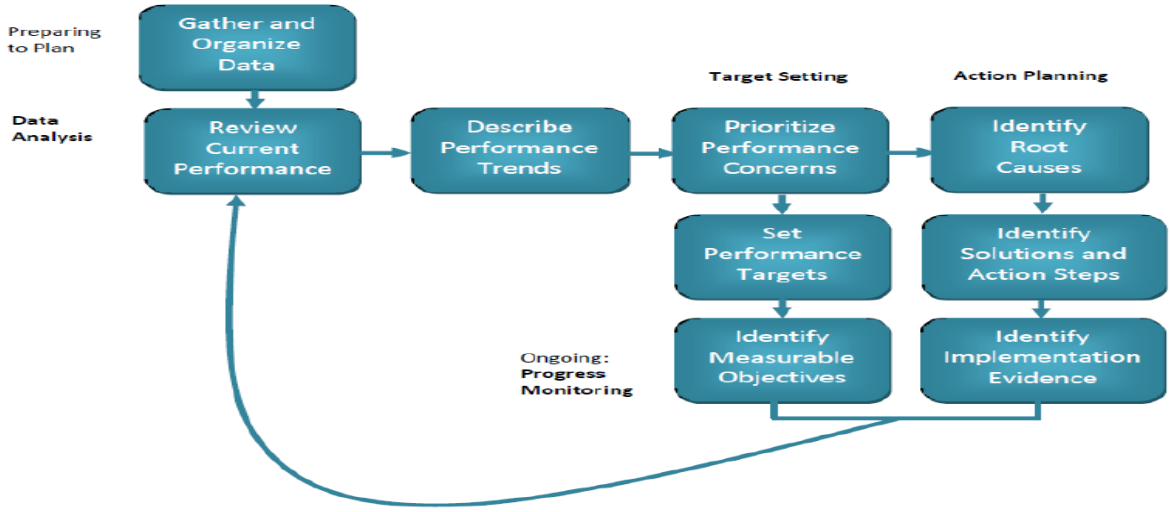

Diagram 2
Steps in the school planning process using the root cause analysis

School Self-Evaluation (SSE) is developed in line with educational quality assurance system, especially that which is linked with the school development plan and school-based management. The implementation of SSE in relation with the ongoing institutional practice and role, such as the school-based management, the school development plan, the school accreditation, the implementation of the National Education System and the National Education Standard, the role of the Educational Quality Assurance, the role of Inspector, and educational management performed by the provincial and regency/city governments, the National Development Plan in Education, the Strategic Plan of the National Education Ministry, and the Strategic Plan of the Religion Ministry.

During the process of School Self-Assessment, it is expected a clear vision on what stakeholders want their school to be can be formulated. In order to formulate a vision, all stakeholders must be involved in the process to agree upon values and principles to be decided on. It is this collective vision that will lead the development of the school to the clearer future. The school measures the impact of its various activities in relation with students and teaching-learning process; every year the school also examines the result and the impact of teaching-learning activities and how it can satisfy its students' needs. The crucial thing in this process is that the school must use the evaluation in order to put priority on a section that needs improvement and prepares development and improvement plans for the school. This process then becomes part of the continuous development and improvement cycle (Rukiah, 2011).

The process of School Self-Review becomes a reflection session to make a change and improvement of work patterns, and it is considered successful if it can bring the school to the improvement of educational services. Consequently, the school will become the main agent in quality improvement and will give assurance to quality educational services.

C. Research Methodology

This research is an investigation and development research. To put it in an outline, it is "a program development to improve the school quality using a fishbone analysis", which is divided into three stages, namely: phase I Preliminary Study, phase II Model Development, and phase III Evaluation/Model Testing. The preliminary study is conducted by using desriptive qualitative approach. The qualitative study is started with literature study, followed by a field study on the educational standards which will be used as a reference for school quality improvement by using a fishbone analysis which will be developed. The preliminary study ends with a description of... and fishbone analysis as findings (Factual Model). In phase II a Hypothetic Model is developed as a basis for the Development Model (product design) which is ready for validation and revision on the basis of the validator's input. Next, a limited trial on the product to be developed is carried out. In phase III Evaluation / Testing Model, the Hypothetic Model is validated, revised and limitedly tried out. The subject for the trial is the Principal of ES Sidorejo District and is conducted using the Focus Group Discussion (FGD). The result is then revised to become the Final Model.

The data obtained in this research are both qualitative and quantitative. The qualitative data come from the input of a management expert and the result of the

interview/FGD with stakeholders. The data are obtained from the assessment of the management expert on the product draft using rating scale, the observation sheet for the field study on the educational standards, and the try out. The instrument for data collection for validity test in this research comes from an expert and the limited try out. The expert's validity test uses validation sheets (experts in educational technology, management, and education policies). The instruments for the limited try out use observation sheets, interview guide/FGD, questionnaire, and documentation.

The expert's analysis on data validation uses descriptive analysis technique. Data from the questionnaire are analyzed by descriptive statistical technique resulting in four categories of data (low, medium, high, and very high).

D. Findings

1. Preliminary Study

The preliminary study phase was carried out by applying descriptive qualitative approach. The qualitative study was started with literature study, then followed by a field study on educational standards which became a reference for school quality improvement by applying the fishbone analysis to be developed. In this literary study, the standard of management originated from the Body of National Education Standards was produced. The preliminary study ended with a description and data analysis as a finding (Factual Model) as follows:

Factual Model

First, there are a few strategic plans which unfortunately are made only by copying and pasting with no modification.
Second, vision is formulated in an ambivalent way.
Third, no sufficient data support.
Fourth, the strategic plan available seems superfluous due to being under instruction rather than a need for making a strategic plan.
Fifth, not just a format or a wrapping, but its content is more important.
Sixth, a real strategic plan is a medium-range plan (five years), as a breakdown of a long-range plan (twenty five years).
Seventh, a strategic plan is not only made by one person, but by all stakeholders together.

2. Model Development (Product design)

The construction of a school quality development model is generally related to the following : 1) School Vision, i.e., a school development profile to be desired in the future (long range), 2) School Mission, which contains actions or efforts to realize the school vision that has been formulated beforehand, 3) Objectives of school development, which describe what to be achieved in developing the school quality during a particular period of time, for instance, 3-5 years, 4) Real challenges faced by the school, that is, a gap between the desired objectives and the present condition of the school, 5) Targets of school quality development, what are desired by the school in the short run, for example, one year, 6) Identification of functions which have important role in the achievement of the targets, 7) Analysis of every function which has been identified, 8) Identification of alternative steps to improve the school quality

in an effort to overcome the school drawbacks, and 9) School plans and programs which are developed from the chosen alternatives in order to achieve the quality target that has been formulated.

One thing that needs attention in formulating a plan of developing school quality is the involvement of all groups of stakeholders, for example teachers, students, administrative staff, parents, community leaders who have concerns about school. Why? Because in that way, the plan to develop the school becomes the decision of all parties involved, will be more expected. It is also true that the involvement of the school members depends on the potential of each group.

School development plan comprehensively covers the long range expectation as dictated by the school vision, the middle range expectation as shown by the school objectives, and short range target as well as how to achieve the target. When the stages are done consistantly, the consequtive target achievements will accumulate and finally the school vision is reached (Winarko, 2012).

3. Hipothetical Model for the Development of School Quality Using Fishbone Analysis

The process of school quality development plan afore mentioned must at least comprise steps as seen in the following diagram. This hypothetical model is equipped with a guide for development steps and instruments used in the design of the school quality development program.

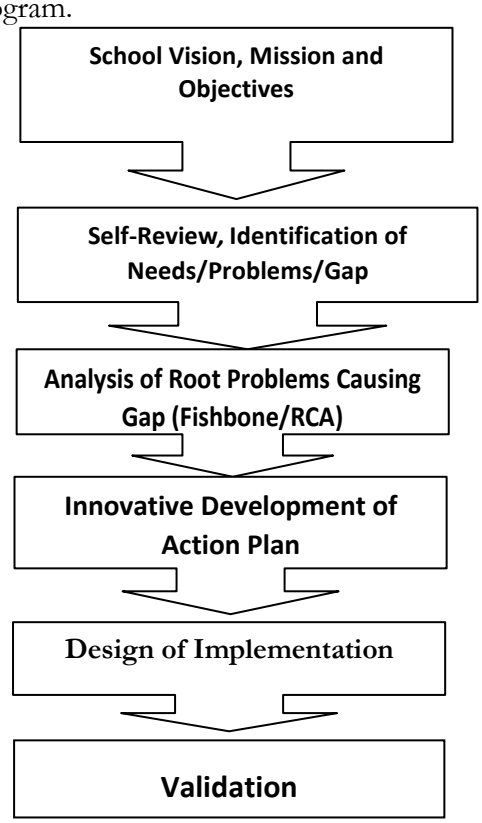

Diagram 3
Hypothetical Model for School Quality Development Using Fishbone Diagram

School Vision
School vision is a mental imagination which serves as a basis or reference in determining future situation specifically expected by the school. The school vision is a basis or reference in formulating mission, objectives, school program targets, and direction for future school development.

Mission
Mission is the breakdown of vision in the form of duties, obligation, and action plans for the realization of vision. School mission consists of a series of tasks which must be implemented by the school. The tasks take the form of activities to realize vision. Starting from vision and mission, the school formulates objectives (Naap, 2007).

School Objectives
School objectives are further breakdown of school mission and are steps away to realize the mission already formulated beforehand. If vision and mission are for a long range achievement, school objectives are for a middle range achievement (3–5 years) (Naap, 2007).

Self-Review
Self-Review is an activity to overview the present situation of an organization. The overview is a means to make clear the way to a better future. It is the basis for future planning. The activity of self-review is done by stakeholders to assess the school.

Identification of Needs and Problems
Identifying needs and problems that the school encounters involves general picture of results of the school self-review in realizing vision, mission, and school objectives. In addition, the identification of management to meet the target is also necessary (Naap, 2007). This step is taken as a beginning stage in doing the analysis of root problems causing the gap by way of fishbone analysis.

Analyzing Root Problems Causing the Gap (Fishbone)
A procedure to use to analyze root problems using Fishbone diagram in the identification of causes of an undesired problem is as follows: 1) prepare Fishbone Analysis session 2) identify effects or problems, 3) identify any main causes category, 4) find potential causes by asking for suggestions, 5) review each main cause category, 6) find consensus for possible causes, and 7) apply analysis results.

Development of Innovative Action Plan
Out of the best alternatives being chosen and trusted to be effective to solve problems, the Principal together with the School Committee develop actions to execute plans and programs to meet the targets (Naap, 2007); (Bahri, 2014).

Implementation Design and Monitoring and Evaluation
In designing a program for improving school quality, each factor or main category as a result of fishbone analysis should be matched with the need for implementing the program as well as with the root problem. For this reason, an Implementation Design

and Monitoring and Evaluation are developed out of the participative model that has been modified. The program comprises 8 steps: 1) Describing a background or a reason for developing quality innovatively in line with the result of the needs identification of each program, 2) Formulating and developing objectives and the advantages of each program, 3) Constructing curriculum/selecting materials appropriate with the target characteristics and time of implementation, 4) Selecting and developing method and technique as well as appropriate media for each program, 5) Deciding on evaluation approach for both the process and the results, 6) Implementing the program as planned, 7) Carrying out monitoring and evaluation, and 8) Follow up.

Validation

Validating a model means to ensure that the program from the model being developed along with its implementation is valid (acceptable). Validation is aimed at making something officially accepted or agreed on, especially after examination.

4. Design Validation

The resulting hypothetical development model for the development of school quality by fishbone diagram was then validated by three experts (1 educational technology expert, 1 educational management expert, and 1 pedagogy expert) using validation sheet instruments that had been provided. Out of 3 validators, it was found that this model showed a high identification of key pattern, in which each phase in the design or pattern is detailed, enough. This model indicates the existence of selection or modification of a part of the process which needs high level improvement the process/steps already developed in this model have high quality, the level of revision which was done in this model is in the moderate level. The model being developed is quite simple and applicable, having high level in its being important, controllable, adaptable, as well as communicable. In addition to the above data, an input was found, such as a need for strengthening the theory, making more clearly (with examples) the syntax of fishbone analysis, and a better setting.

5. Design Revision

Based on the result of validation and input above, the following improvements were made: 1) Completing with a description about the model and the type of model being developed, i.e., model procedure, 2) Elaborating the description about the fishbone analysis theory, 3) Revising the guide by taking into account the input from the validators and the more operational use of language, 4) Editing and setting up the draft into a better appearance. The result of the revision on the hypothetical model into this model is ready for try out in the next phase.

6. Product Try Out

The product tryout---in this case, the school quality development model using the fishbone diagram, was carried out by FGD to 17 Principals of SD Kecamatan Sidorejo, Kota Salatiga. After one session of FGD, the school development program was made. It was agreed that the root problem of the low quality of education in Kecamatan Sidorejo was among others the poor performance of the Principal in PKG

and PKB, resulting in many of the teachers were worried about the application of the Ministerial Regulation (Permenagpan RB) no. 16, 2009 which will be effective in 2016. The agreed solution was the necessity of the principal's assistance and senior teachers (rank IV/A above) to perform Class/School Action Research (PTK/S) and to write out the result of the research in the periodicals or an ISBN scientific journal. After the FGD, mapping the results of fishbone diagram analysis, and developing a program, the program was implemented. At the end of the implementation, assistance in evaluating the participants was conducted.

The result of the participants' evaluation is as follows: the assistance process indicates the fulfillment of the principal and senior teacher's need in assessing teachers' performances in the high level. Activities or phases that need be done by the participants to reach the target are clear. The assistance gave motivation to the participants to conduct Class/School Action Research as required by teacher's Professional Development in a high level. The process in the assistance to improve the participants' pedagogic ability was a good quality one. They became optimistic to follow up their knowledge and skills obtained from the assistance in improving teaching quality in their respective school. The assistance model that has been developed is high enough by considering its simplicity, applicability, significance, controllable, adjustable to the local school condition, and communicable.

7. Revision and Product Perfection

Based on the result of the tryout, substantial improvement did not happen because the participants' assessment is good enough, resulting that the school quality improvement program using fishbone diagram becomes a final model ready to use for perfection. Editing and setting the "Final Model for the Development of School Quality by Fishbone Diagram" based on revision and limited tryout were made according to UNESCO's standard format, that is, in the form of a book sizing in length 23 cm and width 15.5 cm. The final model of School Quality Improvement Model by Fishbone Diagram includes 3 sections, i.e., front, central, and back. The front section includes (outside and inside) and French page; the central part includes 5 chapters: Chapter 1. Introduction; Chapter 2. Theories; Chapter 3. Model; Chapter 4. Effecting Factors; and Chapter 5. Closure. The back section comprises List of references and Guide to Model Operation "Final Model for School Quality Improvement Development by Fishbone Diagram". This book is ready for copyright application.

E. Discussion

Sadono dkk (2014) conducted a research on "Strategy for School Quality Improvement Based on the Fishbone Analisis in SD Negeri Margolelo, Kandangan, Temanggung". They found strategies that must be done to improve school quality with the hope that the school may implement those strategies. In order to apply educational quality management successfully in teaching-learning in a classroom, principles of quality management as formulated by Deming and presented by Juran (in Dean & Bowen, 1994) in which a tool and technique for quality improvement need to be used, make use of fishbone diagram technique. In Gozali's research finding (Gozali, 2012), it was found that there was a positive effect on the improvement of educational quality of MTsN Model Brebes. The school succeeded in creating its educational quality that

meets the standards, both academically and non-academically. Students in certain school graduated with the highest scores above the minimum completion criteria, as well as other their high achievements, will make the school becomes a magnet to the community. In addition, Cahyanti (2008) in her research found that the realization of the school development plan gives effect on the quality improvement of all SMPs in Kabupaten Kendal in as big as 84%.

Sadono dkk (2014) and Gozali (2012) studies both on educational quality viewed from fishbone diagram analysis found a positive results. The research done by Sadono dkk (2014) presented a strategy to solve a problem, while both Gozali (2012) and Cahyanti (2008) only exposed facts and they did not perform treatment. Unlike these studies, the writer produces "a model of program development for quality improvement by fishbone analysis". The result has been proven to be simple and applicable, important, controllable, adaptable, and communicable.

The findings of school quality development program using fishbone diagram analysis (root cause analysis) becomes interesting, since "Pioneering efforts to promote data-driven decision making within districts and schools have found that the active promotion of the effort on the part of the superintendent or principal is vital" (Marsh, 2006). District and school leaders issue the "call to arms" for improving education and using data as a tool to bring about that improvement. Typically, they play a major role in framing targets for educational improvement, setting expectations for staff participation in data-driven decision making (Means, 2010).

The fishbone analysis is certainly a very good way to reveal inside picture of one particular issue. It is of great usage also to for going inside into the story and that help to detect relevant issues simultaneously (American Society for Quality, 2005). The fishbone diagram and analysis was very innovative and efficient way of resolving key issues of the organizations. It has some draw backs but that doesn't minimize the wonderful way of analysis it provides (Bose, 2012).

F. Conclusion

Planning, organizing, mobilizing or leading, and controlling are functions which must be done in the management process. If it is illustrated in a cycle, planning is the first step of the whole management process. Planning can be said as the most important function among other management functions. Planning in its essence is a determining effort to lead the organization to the future and how to reach the destination. Whatever is done later in the management process starts from planning. When planning is done well, the other management functions can be done well (Daft, 1988).

The phases in the school quality development program through planning by using fishbone analysis starts from: 1) an overview of Vision and Mission to formulate school objectives; 2) Self Review, identification of Needs and Problems as a preparation stage; 3) analyzing problem root causing a gap by using fishbone analysis (7 phases); 4) developing Innovative Action Plan; 5) Implementation Design and Monitoring, and Evaluation, which comprise 8 phases; and 6) Validation to make something officially acceptable or agreed on, especially after examination. This research product in the form of school quality development program by fishbone diagram is simple, applicable,

important, controllable, adaptable, and communicable so that it becomes effective and efficient in meeting the school needs to improve its educational quality.

This model is ready for replication in schools where they encounter difficulty or problem in improving their quality of education. For future research on this method, such a research can take place in areas where there are a sequence of causes and a problem of how to put more emphasis on particular causes in higher magnitudes (Bose, 2012).

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