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PPI UTM TESIC 2013

Technology, Education, and Science International Conference

November 20-21, 2013

"Developing Innovative Technology towards Better Human Life" **PROCEEDINGS**

EDITORS

Prof. Dr. Hadi Nur—UTM, Malaysia
Assoc. Prof. Mizugaki Tomoo, Osaka University, Japan
Prof. Dr. Jasmy bin Yunus—UTM, Malaysia
Prof. Dr. Zainab Khalifah—UTM, Malaysia
Prof. Dr. Hamzah Upu, M.Ed—UNM, Indonesia
Dr. Hamimah Abu Naim – UTM, Malaysia
Dr. Bambang Sumintono – UTM, Malaysia
Prof. Dr. Baso Jabu, M.Hum –UNM, Indonesia
Assoc. Prof. Dr. Ishak Bin Mad Shah – UTM, Malaysia
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**TECHNOLOGY, EDUCATION, AND SCIENCE
INTERNATIONAL CONFERENCE 2013**

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PERSATUAN PELAJAR INDONESIA (PPI-UTM)
UNIVERSITI TEKNOLOGI MALAYSIA**

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INDONESIAN STUDENT SOCIETY
UNIVERSITI TEKNOLOGI MALAYSIA
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PREFACE

Bismillahirrahmanirrahim.

In the name of God, the Most Gracious, the Most Merciful

Assalamualaikum warahmatullahi wabarakatuh.

Persatuan Pelajar Indonesia (PPI-UTM), Universiti Teknologi Malaysia has successfully organized the Technology, Education, and Science International Conference (TESIC 2013) on 20th – 21st November 2013 in Universiti Teknologi Malaysia. The theme of this International Conference is “Developing innovative technology towards a Better Human Life”. Technology, Education, and Science International Conference (TESIC 2013) includes a diverse area of research, such as Pure and Applied Science, Technology and Engineering, Clinical and Health Sciences, Social Sciences, Arts and Applied Arts, and Information and Communication Technology.

This International Conference is expected to present prospect for all academicians, scientists, and researchers to encourage, impart and share ideas in promoting research network among interdisciplinary field of studies. There are 142 papers presented by academicians, scientists, and researchers from Asia.

Finally, we would like to extend our gratitude to all those who are involved in the publication of the proceeding of TESIC 2013. It is hoped that this proceeding will contribute to the development of Technology, Education, and Science particularly in Asia and among the international academicians, scientists, and researchers in general.

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FOREWORDS

Bismillahirrahmanirrahim.

In the name of God, the Most Gracious, the Most Merciful

Assalamualaikum warahmatullahi wabarakatuh.

I would like to express praises and gratitude to Almighty Allah because it is only by His permission that I am able to convey my forewords in the proceeding of Technology, Education, and Science International Conference (TESIC) 2013 organized by Persatuan Pelajar Indonesia (PPI-UTM), Universiti Teknologi Malaysia. I would like to take this opportunity to congratulate and compliment the committee members of this International Conference who have consistently work very hard to produce this proceeding.

The publication of this proceeding is expected to benefit as many parties as possible and become a reference for those who wish to gain further knowledge on Technology, Education, and Science.

Finally, I hope that through such initiatives of Technology, Education, and Science event and publication of conference's proceeding, a higher quality of research and publication can be multiplied in the future.

Best regards,

Prof. Dr. Hadi Nur
Ibnu Sina Institute for Fundamental Science Studies
Universiti Teknologi Malaysia

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Lean Innovation for School Program Improvement

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Abstract

Education must be reformed as soon as possible because school's customers have changed fast caused by permanent turbulence and complexity. The school-customers' preference changed based on both their milieu. Lean innovation, as a magic strategy, that was introduced by Sehested and Sonnenberg is very important to apply in school reformation. The aim of this research is to formulate effective strategies for improving the school. It is a qualitative research that researcher described the object intensively. The research finding is the state of Islamic high school Malang-East Java-Indonesia realized the educational activities to be several class programs. They are developed based on student centered and market driven. Consequently, school's outcome must have a competence of knowledge and strategic skills. The writer recommended for other school use it for enhancing school quality.

Keywords: *lean Innovation, customer, program, and high school.*

1. INTRODUCTION

Education Reformation is necessary, especially in Indonesia. In fact, there are some problems happened in Indonesia; in 2008-2009, 34 there were Senior High School and 19 Yuniior High School conducted a cheating massively at Nasional final exam (Ahmadi, 2013:06). The Ethics of American Youth, based on a national survey of nearly 25.000 high school students conducted by the Josephson Institute of Ethics, a nonprofit, nonsectarian corporation. The survey revealed that nearly two-thirds (62 percent) cheated on exams and more than one in four (27 percent) stole from a store within the past 12 months. Additionally, 40 percent admitted they sometimes lie to save money (Parkay, 2006:53). In India Juvenile crime rose 40 percent between 2001 and 2010, according to India's National Crime Records Bureau (NCRB). The spike in violence and crimes against women by young offenders has been even more dramatic. Rapes by juveniles have more than doubled in the same period, murder is up by a third and kidnappings of women and girls has grown nearly five times (Overdorf 2013). Furthermore, a lot of the people in below of the age has become the active smoker, narcotic, free sex, and the actor in criminal. This has included more violent acts, such as murder, which are often related to drugs, gangs or both and any others form of crime that is committed by Juvenile. Recently we have seen on TV and news paper about the fighting between gang of female juvenile in the senior high school. (Drianyanto 2011)

It is necessary to develop the quality of education. If the quality of school has been performed effectively, it influenced automatically to welfare of life. By education, then, the divine essence of man should be unfolded, brought out, lifted into consciousness, and man himself reised into free, conscious obedience to the divine principle that lives in him, and to a free representation of this principle in his life.

School is one a place that most of children should be looked after. Teacher and Principle must be responsible the condition of this place so far. School consist of any people; students, teacher, school employee, principle, superintendence, and curriculum spesialist. Finally, school would be social system. Hoy and Miskel said that the school is a system of social interaction; it is an organized whole comprised of interacting personalities bound together in an organic relationship. Students should study any kind of science and technology in schoo (Miller and Seller, 1985:51).

Madrasah is a part of several schools in Indonesia that has contributed to enhance the quality of Indonesian education so far. Furthermore, Indonesian people, independently and partisipatively, have developed Madrasah seriously. Consequesntly, there are many models of curriculum and school programs have been formulated. They would be a strategic capital for developing Madrasah. Adam and Oleksak expressed that ecosystem is your intangible capital (Adam and Oleksak, 2010:77). Most people must take part to develop madrasah and there are also some desires have to accommodate. Nowadays, effective school is equired by madrasah customers. Fidler introduced that high expectations, academic emphasis, shared vision/goals, clear leadership, an effective SMT, consistency in approach, quality of teaching, student-focused approach, and parental support/involment. (Fidler, 2002:18-72).

2. LITERATURE REVIEW

2.1. Lean Innovation

Lean Innovation is one of strategy in management that must be understood. In order to win the game, we should apply a appropriate strategy. Sometime, strategy is about competitive position, differentiation in the eyes of the customer, and adding value through a mix activity different from those used by competitors. Porter said that strategy is about competitive position, differentiation in the eyes of the customer, and adding value through a mix activity different from those used by competitors (Fahy, et all, 2005:18), but Norman and Ramirez told us that strategy is the art of creating values (Payne, 2005:40)

Lean Innovation is one of strategy used to create favorable value for customer based on cutting the un-useful thing, research-development, and green for milieu. Lean means thin and well-trimmed. Working with lean means working systematically to eliminate all non-value adding processes in order to achieve your goals with the least possible effort. Sehested and Sonnenberg have told us that Innovation is about creating value by solving problems. Creativity is a prerequisite for problem-solving and is brought into play at various points during the process. But creativity alone is not enough. It needs to be put into a frame-work ensure that the solutions are actually put to use. Innovation is also about knowledge. At the beginning of an innovation process, the knowledge you have about the problem you are trying to solve is usually limited. Through the process, you learn more about the problem and its possible solution and based on this knowledge you choose between different possible solutions. This makes innovation a learning and prioritization process. Lean innovation is about working efficiently with knowledge. Put simply, lean innovation is about getting smart fast. Cut to the bone, lean innovation helps a company do three fundamental things. First, to do the right thing, then to do it right and finally to do it better all the time. (Sonnenberg & Sehested, 2011:3)

There are four dimensions of management task to apply the three fundamental things in lean innovation. Sehested and Sonnenberg said: i) discipline management is management of specialist knowledge and competencies that give the knowledge-based organization its legitimacy. Without a specialist competency that can be used to solve tasks, you could say there would be nothing to do business with. Most managers are aware of this fact and spend a good deal of time and resources enhancing specialist competencies. In most knowledge-based organizations, this area consumes most of the development resources, often representing 80-90 percent of investments, ii) the management of customers relations. A company needs to have a good understanding of customers' point of view, because without that, the company cannot exist. There would be no demand for knowledge and services the organization has to offer. Handling customer relations is an important management task. You have to be able to maintain a dialog with customer as well as defines they needs. It is crucial that you understand what is to be made how it is to be delivered, iii) people management. If this area is not functioning properly, there may soon be only one employee left in the organization-the manager. The management is responsible for ensuring the well-being of their employees, creating motivation, recruiting right talents etc. The value generated by knowledge workers can vary greatly, depending on how motivated, liked and appreciated they feel, iv) the fourth element is task management, which focuses on how we carry out jobs for customers. This included everything that addresses the challenge finding the best possible way to bring the employees' competencies into play in relation to each other. Task management involves working with processes and methods because of the dominant working method in knowledge based organizations is project work, it will, in many cases, also focuses on how projects are organized and managed. Task management is just as important as the other management tasks. However, highly discipline-oriented organizations tend to neglect this area because both management and employees are very individualistic and focused on own specialist competencies. (Sonnenberg & Sehested, 2011:3)

Implementing lean means that managers will have to work systematically to develop and maintain the organization. They also said that there are four questions must be have; why are we here?; where are we going?; how good are we?; and with lean, we can add four question; how can we get better? (Sonnenberg & Sehested, 2011:3)

2.2 School Programs

Formulation of vision is a basic program for school reformation. Vision reorientation should be done continuously because some factors force school to change adaptively to the condition. School innovation can be viewed through the sophisticated vision formulation. Murgatroyd and Morgan said that vision is a share image of fundamental purpose (Murgatroyd & Morgan, 1994:80). School principle and school Board committee should socialize the vision to all people communicated by school institution. Sallis advised that

executive school leaders must communicate the vision and values of institution to others (Sallis, 1993:86)

Education program management is necessary for school stakeholder to do in order to supply what customer's needs. Education should be able to fulfill customer's desires what students, teacher, student's parents, and government needs. They would be completely sustainable customers that can support to school system effectively and accurately.

Supporting continuous improvement is key element of lean. A central aspect of a lean culture is that every employee makes a conscious effort to identify improvement opportunities and help to find solutions that can be worked in practice. Basu and Wright identified opportunities and solution by six sigma cycle as follows; define opportunities, measure performance, analyze opportunities, improve performance, control performance (DMAIC). 1) Define opportunities (D) is done through identifying, prioritizing and selecting the wright projects. The key elements of this step include: validating business opportunities, documenting and analyzing possible projects, establishing and defining customer requirements, assessing benefits, and selecting projects. 2) Measure performance (M) of the project and process parameters. The key elements of this step include: determining what to measure for inputs, process and outputs, establishing a plan for data collection, validating results, and analyzing variations, and determining the level of sigma performance, allowing for process capability. 3) Analyze opportunities (A) are analyzed by identifying key causes and process determinants. The key features of this step include: analyzing the input-process-output (IPO) to focus on problem areas, analyzing the flow process to identify non-value-adding activities, determining root causes, validating root causes. 4) Improve performance (I) is achieved by changing the process so as to optimize performance. The key elements of this step are: generating improvement ideas, quantifying and selecting solutions, presenting recommendations, implementing change. 5) Control performance (C) is essential if gains are to be maintained. The key features of this step include: developing and executing pilot projects, planning and implementing solutions, monitoring and evaluating results, project closure is established as standard operating procedure, and recognizing (celebration) of benefits gained.(Basu and Wright, 2003:47-48)

3. METHOD AND DATA

This is a descriptive-qualitative research. The writer should interpret various natural-variable of the object. It means that he must study all things in their natural setting and attempt to make sense of phenomena. One of the unique in qualitative research is the researcher himself as the main instrument, while the non-human nature as an instrument complementary data. The presence of the researcher is a mean for succeeding or understanding of some cases. Researcher acted as the primary instrument in data collection. It took a place at MAN 1 and 2 Malang-East Java-Indonesia. Both have characteristics that can fulfill the requirements of the main purpose of this one. There are three instruments to collect the data; in-depth-interview, observation and documentation. After collecting the data from main sources, he must analyze them using interactive data analysis introduced by Miles and Huberman; Reduction, display, and conclusion/verification.

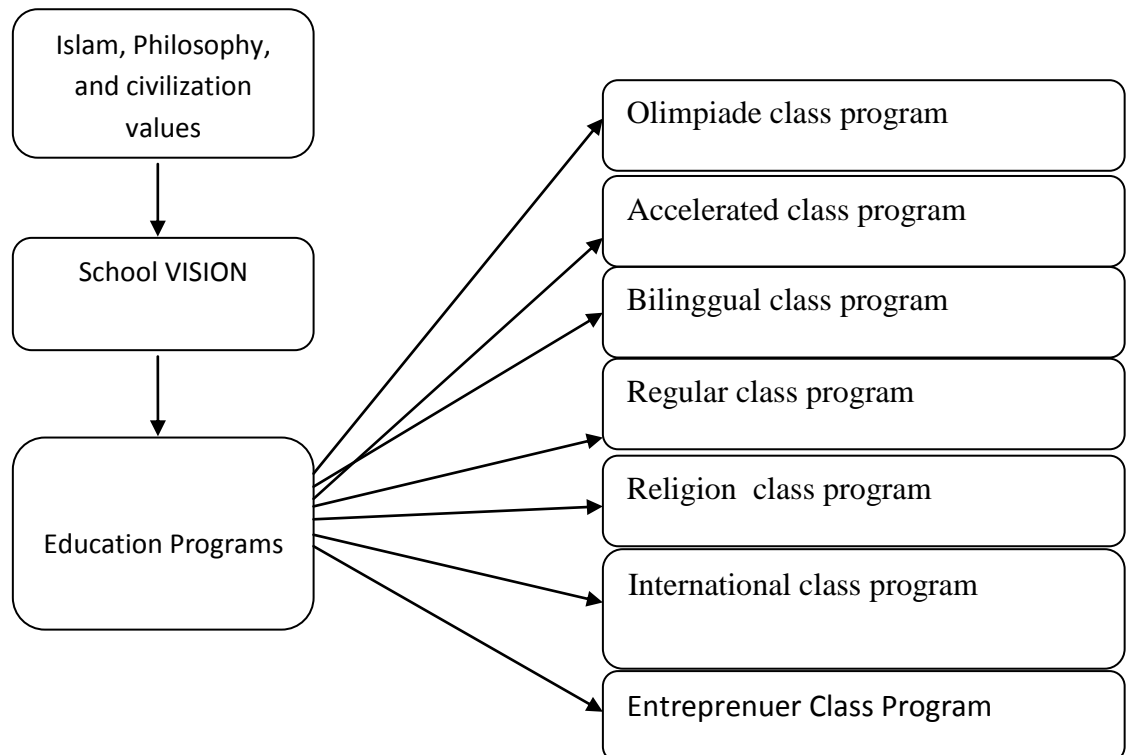
The result of this study as follows; both schools analyzed the changes both internal and external for formulating school's vision, mission, target and values. School Board and School Principle have constructed together the school's vision based on the characteristic of school's customer needs and market driven. School's vision is used to guide the direction of school that must be managed. There are four components of the vision that consists of customer's necessity that closed relationship with a model of institution, outcome's competence, and core value.

MAN Malang selected many kinds of strategies from SWOT analysis. It would be formulated to become several strategies as follows; i) strength-opportunity strategy, ii) weakness-opportunity strategy, iii) opportunity-threats strategy, and iv) weakness-threats strategy. SWOT activity can be strengthened by ensuring the analysis focuses on both the customer requirements. The other hand, they also used strategies from competitive context. It would be other strategies adapted from: resources based, market-driven, rational based, nonlinear, process, systemic, Qur'anic, and competitive based strategies.

The implementation of lean innovation, MAN Malang has realized the transferring of responsibility from school principle to any kind of school's small teams. It has implemented them to win the competitiveness in the school's market. So, MAN Malang East Java Indonesia has performed quality reformation in education: i) formulating vision, mission and goals continuously, ii) conducting the milieu changes analyses, iii) recruitment the professional teacher and school employees, iv) alignment among vision, mission, strategy,

and school's core values. v) spesification and standardization of school quality, vi) developing school programs' based on customer demands, vii) making annual years of school programs based on financial allocation, (viii) performing indicator, target, and financial of each school programs, viii) formulation of school income, and ix) conducting the evaluation continuously.

MAN Malang has also made segmentation of science and students' preferences based on mind, heart, and spirit. There are several school programs such as: IPA and IPS olimpiade class program, IPA- IPS accelerated class program, IPA and IPS Bilingual class program, IPA and IPS regular class program, BAHASA Olimpiade class program, AGAMA International class program. It can be described at the following Fig:



MAN Malang conducted alignment among the students' competence, preference, market driven, and human resources allocation. There several steps must be done: i) identification the students' competence and preference, ii) intensification and guidance to students' potential and competence, iii) facilitation what teacher and students' needs, iv) coordination among institutions, v) Making Memorandum of Understanding (MoU) with other institutions, vi) coordinating among sciences concentration with students' competence and preference.

MAN Malang has continued to rebrand, reprogramm dan reposition the education program consistently and communicatively. This strategy is used by Madrasah to supply what the school's customer needs and market driven. Moreover, it was also used to face the compitator of other schools that have conducted socialization intensively, for example; Vocational school, Integrated School Program, and Community College.

In the successful of information technology, there have happened a permanent turbulence everywhere and anywhere especially in the market and rapid changes in the context in which school operate. It would be advantages because revolution in the form of frame-breaking innovation that departs from past practice is the only method that will create sustainable advantage. So, MAN Malang forced to teacher, students, and school employee to accelerate their competence with the following steps; (i) there has been permanent changes because of education otonomy in Indonesia, consequently, it would influence to school organization management, paradigm of school's vision, teaching-learning process, and knowledge culture. In this condition, MAN Malang appreciated to local culture, partial intelligence, differentiation, preferences, actualization, acceleration, existention, intensivication, and communication. (ii) MAN Malang mobilized ICT as a means of communication among school in order to be globally, and iii) MAN Malang also drived to innovate their knowledge products with improvement their research and development.

Revitalitation of center for learning reorientation of MAN Malang as center of education, training, and R & D are important enough. It has some activities such as; (a) workshop for teacher related with curriculum development, teaching-learning strategy, ICT based learning,

and school management. (b) In house training for school employees, library management, laboratory management, and school program management.

4. DISCUSSION

All people understood that condition of economy in both poor and rich countries have happened unpredictable including Indonesia and USA. There're three factors determined to education and economy have to change rapidly. The first, reformation and otonomy should be implemented all Indonesian territory. Information and technology take part in this condition, so science and civilization developed significantly. So, It is necessary for MAN Malang to increase the human resources management to anticipate this condition. Those are; i) the principle has done the rehabilitation of infrastructure needed by school, (ii) rebranding Madrasah image through profiling the system of madrasah, iii) improving Madrasah culture, iv) enhancing students' capacity and the professional teacher, v) and developing school program based on multiple intellectual intelligent., vi) guiding and facilitating education profession; teacher organization and principle organization, and students intra organization. From the capability, MAN Malang penetrated school market intensively through making several education programs based thinking skill as basic for developing the quality of life. Itami advised that invisible assets are information-based resources such as technology, customer trust, brand image, and control of distribution, corporate culture, and management. (Barney and Clark, 2007:18)

There are something that are produced and marked locally should be mobilized globally. Alfred told us: A three-dimensional organization of strategic theory consists of; (i) the extent of change an organization will undergo as part of the strategy; (ii) the location of attention in the strategy internal-external, and (iii) the basis of the strategy formation-process based or context based. (Persson, 2007:27-29). The second, emancipation has also influenced to paradigm that girl or woman have opportunity to take participation in public issues or working, for example, bank, school, supermarket etc. So, family problems increased rapidly and it needs a solution as soon as possible. The third one, The Government policy of incentive for professional teacher and lecturer can increase economic cashflow in family. So, the capacity for shopping and taking tourism individually will be truthfulness.

Every student has competences to create academic values and marketing the values to school's customers. In this case, MAN Malang differentiated education class program for supplying differentiation of students and customer's preferences based on mind, heart, spirit and body. For instant; exact, social social, entrepreneurship, accelerated, olimpiade, bilingual, regular, religion, and international class programs. Barney and Clark (2007: 128) developing the competence of human resources can be a core performance in corporation. Armstrong (2006:3) said that it is a strategic and coherent approach to the management of organization's most valued assets-the people working there who individually and collectively contribute to the achievement of its objectives. Intellectual professional in the world especially school quality.

The improvement of modern business that leads to economic globalization and unboundaries geography among nations because of information, communication and technology has influenced to paradigm for business community to become knowledge based community that has effected to knowledge based competition and knowledge based opportunities. Adams advised that the combination of all the intangibles in an organization is intangible capital (IC). So, the mastery of knowledge assets absolutely must be done if we want to gain successful in all aspect because of those creates sustainable competitive advantage for school and corporation.

All people in school; students, teacher, and school employees should be managed a strategic formulation. Those have intellectual asset that can meaningful for life. In this case, it should be an intellectual property strategy because intellectual professional can change infrastructure of school to be sustainable advantages in the era of knowledge based community which refers competence, competitive, and opportunity values.

5. CONCLUSION

It is necessary to anticipate the new wave technology era by mastering the knowledge and technology comprehensively that forced the milliu will be a knowledge based community. Knowledge needs intellectual to produce any kinds of competitive advantage that can create new value needed by school's customers. Intellectual used to be a core of lean innovation to create sustainable advantages in social context, especially about the changes of place, time, and opportunity. Finally, it must give sustainable competitive advantages automatically in the world and hereafter.

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