

ANALYZING THE POLICY CYCLE PHASES IN THE MALAYSIAN EDUCATION SYSTEM: A CASE OF SMART SCHOOL

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Abstract: The Smart School Policy initiative in 1999 was in line with the Malaysian Government's goals for technology utilization in the teaching-learning processes. The Malaysian policy was designed to ensure that the education system is set up for the citizens in the future as knowledge workers for the Information Age. It was also aimed at preparing Malaysians to be able to attain the country's vision of becoming an entirely developed nation by 2020. Establishment of the Smart School Policy can be considered as an effective policy for implementing change in the Malaysian Education System. The purpose of this paper is to analyze the four phases of the "policy cycle" including formulation, implementation, monitoring and evaluation in terms of the Malaysian Smart School Policy. Through analyzing the policy cycle, this paper also aims to evaluate the achievement status of the smart school policy in the Malaysian education system. The findings of this study showed that the major changes from formulating smart school policy was for the teachers and students in terms of ICT awareness and technology literacy. It also revealed that formulation of smart school policy in Malaysia is able to help the country not only to achieve its goals in producing human capital with ICT skills but also to prepare for the skilled knowledge-based society in the near future.

Key words: Policy cycle, Smart school policy, Malaysian education system

I. INTRODUCTION

The meaning of policy is a decision that made by the authorities for the purpose of "initiating a change of a situation or change of a behavior in the interest of welfare, order, development, and prosperity of a government or an organization" [1], [2]. During the past twenty years, using new technologies in the education system was one of the ambitious policies for the world's governments to deal with the new changes arising from globalization. Likewise, in Malaysia as a developing country, establishment of the Smart School Policy was the scheme initiated in order to change the educational culture to the one which is more conversant, thinking, and innovative in using technology as an enabler in teaching and learning.

The Smart School Policy (SSP) initiative in 1999 was in line with the Malaysian Government's goals for technology utilization in the teaching and learning processes. The policy was designed to ensure that the education system is set up for the citizens in the future as knowledge workers for the Information Age. It was also aimed at preparing Malaysians to be able to attain the country's dream of becoming an entirely developed nation by the year 2020[3].

The Eighth Malaysia Plan was the pioneer to emphasize on the culture of innovation and change through re-engineering the country's education system. This attempt was in line with the national long-term mission called "Vision 2020" [4].

Nevertheless, the Smart School Policy is devoted to the task of regaining excellence in the Malaysian education system. Without a doubt, the Malaysian smart school policy was premised on the

strong belief that information and communications technology (ICT) is a key enabler to democratizing education through communicating the learning aspiration to all the students.[3]. In line with the meaning of *policy*, the establishment of the Smart School Policy can be considered as an effective effort in implementing technology changes in the Malaysian education system. In order to manage these changes in an efficient and sufficient manner, there is a need to understand and analyze the various phases of the policy process. However, in today's fast changing world, the critical role of technology change in the Malaysian education system is a basis for the need to effect "fully utilization of systematic process and phases of the policy cycle" [2]. Due to the issues and challenges related to the implementation of the Smart School Policy, following the various phases of the policy cycle can be considered as a guideline for the Malaysian education policy-makers in order to identify the inherent issues and problems in each stage, therefore analyzing these issues based on their seriousness, value goals, and beneficiaries in order to make an effective policies.

II. THE SMART SCHOOL POLICY CYCLE

Developmental process of any policy consists of four main phases, namely formulation, implementation, monitoring, and evaluation. This process which is similar in any field of policy-making including education is called *policy cycle*. For the effective implementation of the policy, knowledge on policy cycle and education policies should be used as a guide by government agencies and private organizations. In short, considering all the four phases of the policy cycle and analyzing their important points is the essential task for governance and management of the education system.

Fig. 1 illustrates the various phases of the Smart School Policy Cycle. As shown in this figure the core components and the initial stage for establishing the policy is to identify the vision, mission, goals, objectives, and values. These key components will provide a sense of direction as to what ideals are to be achieved and to what extent things are going to be improved in the policy establishment [1].

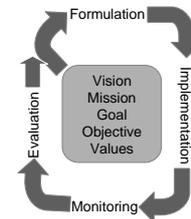


Fig. 1 the overview of the policy cycle phases with the emphasis on vision, mission, goals, objectives & values

The ensuing sections are the elaboration of the smart school policy cycle phases.

A. Phase One: Formulation of the Policy

In Malaysia, policy formulation in the education system means a decision made by the government authorities through the Ministry of Education in order to be implemented in the education system. Moreover, formulation of an education policy always follows the steps to achieve certain goals and values. It also needs a clear vision and mission to formulate it in an appropriate manner based on the reality of the current situation. To achieve the policy vision, mission, goals, and values, identifying the current issues and problems in line with proposing possible solution will help the policy-maker to pass the formulation phase successfully to the next one.

Formulation of the smart school policy was the Malaysian government's ambitious initiative to achieve the goals and values such as to discipline and change the current educational culture in order to improve services and facilities for teaching and learning purposes. It was also aimed at addressing the needs and requirements of the education system as well as solving problems affecting the teaching and learning processes. Correspondingly, the main vision of the Malaysian government was to introduce new change and developments to the education system through utilization of instructional technologies in forms of ICT. For Ministry of Education Malaysia, ICT perception in education system consists of tools that facilitate the transformation of the country into the knowledge-based society by the year 2020 [4].

According to the Ministry of Education [5] the main vision of government for implementing the smart school policy was to provide opportunity for all students to practice technology utilization in their learning environment. This is due to the goal of

developing a skilled and knowledgeable workforce to face the future challenges of globalization. Accordingly, the policy has been formulated in a manner that is able to benefit all the students nationwide.

Restructuring the Malaysian educational status qua to the more innovative and dynamic form of school management and the learning system delivery was the main vision of the Ministry of Education in formulating the smart school policy [6], [7]. The ministry’s effort in implementing this policy was unique; through the “simultaneous” approach the vision encompassed ICT infrastructure, change management, and technology integration.

Fig. 2 shows the simultaneous approach of the smart school policy.

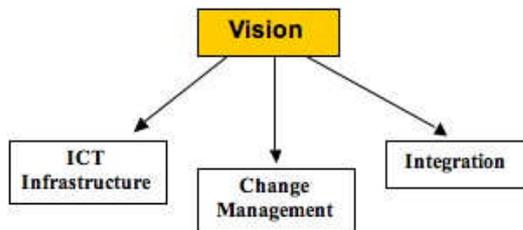


Fig. 2 Malaysia’s simultaneous approach [cited from the Reference [7]]

However, the vision of the Malaysian government for formulation of the smart school policy is that “technology is just an enabler and not a driver, and its presence in the schools does not mean it can catalyze better educational outcomes” [4]. Correspondingly, the main mission is utilizing ICT and learning technologies in the nationwide schools is geared toward teaching and learning effectiveness. This is because, in the current changing societies, the potential of ICT in providing opportunities for the education system and making teaching-learning more interesting and inspirational is beyond doubt. Apart from transforming the education system through technology utilization, the other task for the government was to provide opportunities for the Malaysian students to become more technology savvy in the near future. [4].

Since the Smart School is a learning institution that has been reinvented in terms of teaching and learning method, thus one of the key objectives of the policy was to prepare students for self-managed, self-directed, and self-paced learning. Therefore, all the elements in the smart school including school administration system attempt to prepare the learning institution with the aim of bringing creativity and better management of

information which is facilitated through the use of ICT and learning technologies. This is where the students, teachers, administrators and parents are better prepared to face the current challenges of the Information Age. [8]

However, based on Malaysia’s National Philosophy of Education, there are five main goals and objectives that are stated as the rationale behind establishing the smart school policy in the country, as follows:

- To provide all-round development of the individual, (intellectual, physical, emotional, spiritual)
- To provide opportunities to enhance individual strengths and abilities,
- To produce a thinking and technology-literate workforce,
- To democratize education, and
- To increase participation of stakeholders [4].

Table 1 summarizes the goals of the smart school policy and the strategies by the Ministry of Education Malaysia for the implementation of the policy as follows:

TABLE 1
GOALS AND STRATEGIES FOR SMART SCHOOL IMPLEMENTATION
Cited from Reference [9]

Goals	Strategies
to provide all-round development of the individual	<ul style="list-style-type: none"> • Provide a broad curriculum for all • Teach values and language across the curriculum • Emphasize thinking skills
to provide opportunities to enhance individual strengths and abilities	<ul style="list-style-type: none"> • Provide electives in the curriculum • Allow for vertical integration (virtual express class)
to produce a thinking and technology-literate workforce	<ul style="list-style-type: none"> • Teach thinking across the curriculum • Apply technology in teaching and learning
to democratize education	<ul style="list-style-type: none"> • Provide equal access to learning opportunities • Provide for differing abilities, styles, and paces of learning
to increase participation of stakeholders	<ul style="list-style-type: none"> • Create awareness of what happens in schools • Enable easy and speedy communication with the school using technology • Provide opportunities for stakeholders (e.g. parents, community) to participate.

In addition to the above strategies, following in order to achieve the mentioned goals and objectives, three main policies has been formulated by the Ministry of Education for utilizing ICT in the education system of the country as follows:

- 1) ICT utilization for all students nationwide. This policy meant that ICT is used as an effective enabler to reduce the digital gap between the schools.
- 2) ICT as an effective teaching and learning tool. This policy emphasizes the use of computer for accessing information, communication, and as an efficiency tool for enhancing teaching and learning

outcomes.

3) ICT as a helpful tool to increase management system productivity, efficiency and effectiveness. This policy highlights the extensive potential of ICT to automate and mechanize work processes such as the processing of official forms, timetable generation, management of information systems, lesson planning, financial management, and the maintenance of inventories [10]

Finally, the main concept of all the mentioned elements such as vision, mission, goals, objectives and values that has been planned by the Ministry of Education for the formulation of the smart school policy is about the effectiveness of the teaching and learning process. The policy has been designed in order to help the students achieve overall and balanced development in their learning journey.

B. Phase Two: Implementation of the Policy

The second phase of the policy cycle is implementation. The importance of this phase is that the policy goals and objectives which were planned throughout the previous phase will be changed into the specific programs, actions, and principles. The most important principle for implementing a policy is that the policy must cater for the welfare of the target group at large. This means that policy implementation should be beneficial for the majority of the people who face the policy, not just for the minority group. On the other hand, a policy should address the underlying problems so that it has a high chance of success and can be extended for a long time. In addition, implementing a policy should have generated high benefit at low cost for the government. Therefore, accounting the possible expenses and profits of the policy in a proper manner is among the key issues that need to be considered in the implementation phase, although benefits sometimes are not tangible, but must be estimated [1]

Nevertheless, before implementing any policy there is a need to assess the status quo. The pre-implementation assessment would help the policy makers to receive useful information on making assumptions about the policy. Moreover, it will help them to avoid mistakes in the implementation phase.

Correspondingly, implementation of the Smart School Policy was to address the need to transform the policy for utilizing ICT in education into an implement-able project. The implementation of the policy was in line with the country's key objective to build up a national ICT policy, as well as planned initiatives, and the creation of the necessary information infrastructure nationwide. Hence, the intensive decision of the Ministry of Education about the concept and philosophy of implementation of the

Malaysian Smart School was begun in early 1996 [4].

Re-formulation of the Malaysian education system in order to enable students to become active and innovative learners was the main intention of the government's action in implementing the smart school policy. From this action plan the government decided to create the Pilot Project of Smart School in 1999. Through this project a group of 88 schools become the basis for "the ultimate nationwide roll-out of Smart School concepts, materials, skills and technologies" [4].

The Fig. 3 shows the structure of Malaysian Smart School implementation as follows:

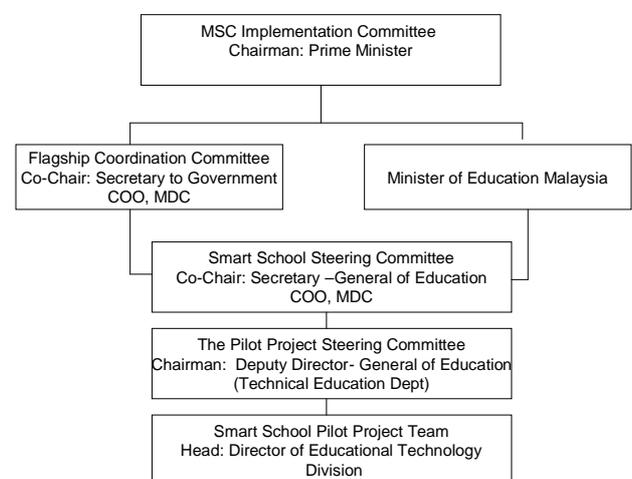


Fig. 3 The Malaysian Smart School Implementation Structure
Cited from Reference [4]

However, the implementation of the policy of smart school pilot project intended to help the Malaysians to achieve the goals of the country's Philosophy of Education to cultivate the increase of the human capital that are prepared to face the challenges of the current information era [4].

B.1 The key Elements in Implementing Smart School Policy

The Ministry of Education in 1997, under *The Smart School Blue Print* has identified five elements as the key basis for implementation of the smart school policy as follows:

- *Teaching and Learning*

The core and main element in the Malaysian Conceptual Model for Smart School policy is teaching and learning. The importance of teaching and learning in this model is in line with the country's National Philosophy of Education that

states “Education in Malaysia is an on-going effort towards further developing the potential of individuals in a holistic and integrated manner...” [11]. However, through the Smart School Pilot Project, the teaching and learning materials were developed for only four selected subjects, namely, Bahasa Melayu (Malay Language), English Language, Science and Mathematics. These materials included courseware in the format of browser-based, teachers’ guides, student worksheets, and standard pattern for lesson plans [12].

In order to standardize the instructional design for the teaching and learning materials in the smart schools, a guideline has been developed by the Ministry of Education through the Smart School Conceptual Blueprint [12]. The main intention in developing such a guideline was to address the need for a specific curriculum which could be able to answer the pedagogical demands of the smart school learners:

- Must cater to the different capabilities of students, for example, their learning styles, multiple intelligences, and learning modalities;
- Be suitable for a variety of learning environments, ranging from teacher-centered to student-centered environments;
- Allow students to practice self-paced, self-accessed, and self-directed learning;
- Must have built-in assessment capabilities so that assessment records can be stored electronically for teachers to monitor student progress;
- Promote values, skills (especially creative and critical thinking skills), knowledge and language across the curriculum; and
- Allow for horizontal integration between subjects, and vertical integration between learning areas in a subject [13].

- *Management and Administration:*

Supporting teaching and learning processes as well as managing the relevant resources are the main criteria for the management software of the smart schools. By automating the management and administration of the school, the software called “Smart School Management System (SSMS)” helps the principals to deal with the new changes arising from implementation of ICT in their school system. The areas that have been recognized for SSMS include School Governance, Student Affairs, Educational Resources, External Resources, Finance, Facilities, Human Resources, Security, and Technology.

- *People, Skills and Responsibilities:*

Enhancing the school’s performance is not just about instructional perspectives; it also very much depends on the active role of all stakeholders including parents, community and the private sector. On the other hand, preparing the principals, teachers and Ministry of Education officers and support staff with the efficient and sufficient skills and knowledge in terms of ICT utilization in the education system, also plays an essential role in ensuring effectiveness of the whole project.

- *Technology:*

In the Malaysian Conceptual Model of Smart School, technology is used as an enabler in the context of teaching and learning, school management and interactions with external communities.

- *Processes:*

In the critical journey of transforming the education system into the smart school format, there is a need to ensure the accuracy of the efficient input in order to produce the functional output. In such a context, continued monitoring and analysis of the processes is an essential task for the authorities.

- *Policies:*

To ensure the successful implementation of the smart school initiative, existing policies and regulations may need to be changed, or new ones formulated [4].

The components of the Conceptual Model for Malaysian Smart School are shown in Fig. 4 as follows:

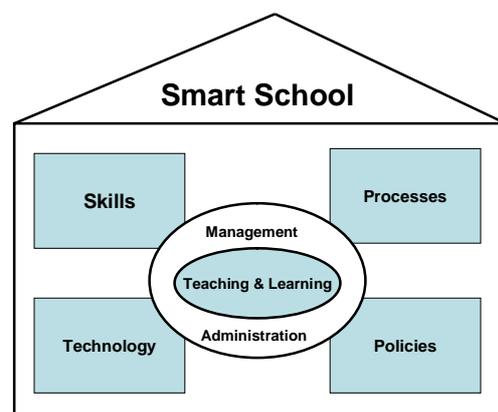


Fig. 4: The key elements in Malaysian Smart School Conceptual Model (Source, Reference [4])

C. Phase Three: Monitoring of the Policy

The next phase of the policy cycle is policy monitoring. Policy monitoring is one of the most important parts in the policy process. This is due to the essential role of monitoring in the policy's outcomes. In other words, appropriate monitoring results in a good outcome, and insufficient monitoring results in an unsatisfactory outcome. In addition, policy progress monitoring includes observing the supply and acquisition, contractors, budget, grass-root implementation, and initial assessment on the beneficiaries [1].

Correspondingly, the monitoring phase can help the Malaysian education policy-makers to observe the efficiency and appropriateness of the smart school policy implementation. In this phase useful and relevant information about the previous phase in terms of success or unsuccessful policy execution will be provided. Moreover, effective and efficient policy monitoring could help the education authorities to identify the problems and issues from time to time. This identification leads the policy makers to adopt the action plan in order to modify the issues in successful implementation [1].

Likewise, the smart school policy needed sufficient and adequate monitoring in order to achieve the formulated goals, objectives, and values. This was in order to impress on the initial beneficiaries the urgent need for supervision and support of the policy. Hence, the Smart School Roadmap needed to include monitoring as a fundamental part of the *Development Plan for Smart Schools* [4].

Planning for monitoring the execution of the smart school policy is authorized by the Ministry of Education as the main body. Besides, the state education departments, district education divisions and the pilot projected schools' principals also act as authorized agencies to monitor the policy implementation.

Finally, the main role of monitoring phase in the smart school policy is to monitor supply and acquisition, monitor budget, rectification, and initial assessment on beneficiaries [1].

D. Phase Four: Evaluation of the Policy

The final phase in the policy cycle is evaluation. Policies need to be evaluated in terms of their effectiveness and efficiencies. This is to sustain the benefits of the policies to the target group.

Evaluation provides the policy-makers with the relevant knowledge about the possible inconsistency between predicted and genuine policy performance; hence, a good example of evaluation is the type of analysis that contributes to the explanation, analysis, and discussion of the formulated goals and values of the policy.

For the authorities, policy evaluation is an important task in measuring the policy's outcomes as well as finding out its results. In order to achieve sufficient and efficient results from the evaluation phase, policy-makers need to consider an appropriate time for the implementation phase. Evaluation usually takes several years after the initial implementation of the policy [1].

The main purposes of policy evaluation in the smart school pilot project were to investigate and assess the extent of benefits and amount of satisfaction received by the stakeholders of the education system. These stakeholders include students, teachers, staff, administration and principals, parents, the ministry authorities, and the government of Malaysia.

Evaluation of the smart school policy helped the country's education authorities and policy makers to assess the actual costs and expenses in the implementation phase. It also helped to address the key questions regarding the implementation project such as either the policy implementation is on the right track, or is it in line with the planned vision and mission, and finally is the implementation of this policy addressing the needs and requirements of the education system. Moreover, it would help to evaluate the efficiency of the implementers in conveying logistics and operational dynamics. Finally the evaluation phase would help the education authorities to study the issues, challenges, barriers, and problems in the implementation process and enable planning of proper counteractive measures.

Nevertheless the policy implementation journey would not end with the evaluation phase, but reporting and analyzing the quality of the policy as well as its main outcomes to the public specifically education system's stakeholders was the key task for the Malaysian education authorities. After analyzing the outcomes of the policy, the next step in the evaluation phase is deciding on the continuation or discontinuation of the policy. This action also consists of calculating the cost-benefit ratio of the policy [1].

Commissioned by the Ministry of Education and Multimedia Development Corporation (MDeC) an evaluation study was conducted by different groups, to assess the effectiveness of the *Smart School Pilot Project* for the users. The other reason for conducting these studies was to maintain the advantages of the policy [4].

In conclusion, the following points are the key areas in the evaluation studies for smart school policy:

- Teaching-learning material
- Teacher training for technology utilization
- Attitudes towards the change
- Technology infrastructure

- Help desk
- The smart school management system (SSMS)
- Students and parents' feedback on the policy implementation [4].

III. RESEARCH METHODOLOGY

For the purpose of this paper a qualitative research methodology was used to analyze the four phases of the policy cycle including formulation, implementation, monitoring and evaluation in terms of the Smart School Policy in the Malaysian education system. The data were collected through three different sources including open-ended interview, direct observation, and documents review techniques. Using different sources of evidence was the advantage to find in-depth data on the four phases of the policy cycle in the Malaysian smart school setting. A smart school was chosen as the case school for this study. The rationale for choosing this case was because the school is one of the pioneer schools among the total of 88 pilot project smart schools in Malaysia. The interviewees were from various individual groups including the school administration, teachers, students, as well as the school's ICT coordinator, and ICT technician. Apart from interviews, data were also collected from direct observation in terms of ICT utilization in the school's curriculum as the main element in the teaching and learning process. The official documents which were reviewed and analyzed in this study included the "Malaysian Smart School Blueprint (1997), the Malaysian Smart School Roadmap (2005), official documents published by the Ministry of Education since 1997 related to the Smart School Policy, as well as the school profile, and the school Plan for the different divisions and departments.

However, the data obtained in this study were analyzed using grounded theory approach including open coding, axial coding, and selective coding. The raw data were organized, managed, and analyzed by using NVivo 8 computer software. Finally, the Ladder of Analytical Abstraction [14] also used as a framework to guide the qualitative process of the study.

IV. ANALYSIS & FINDING

A. Formulation Phase

This study found that the formulation phase of the smart school policy cycle included some changes in the educational system of the pilot project schools. According to the data analysis these changes were mostly related to the students' and teachers' perception on the technology utilization in the teaching and learning processes. The following

key points were agreed by the participants as the main technology changes from formulating the smart school policy in the educational system of Malaysia:

- Awareness of ICT implementation in teaching and learning,
- ICT literacy

From the data analysis, the main objectives in formulating the smart school policy in the Malaysian educational system were highlighted from various points of views. From the administration and management perspective, the main goal in formulating the policy was to produce human capital with ICT knowledge in order to compete in a globalized world. But from teachers' view it was to help the students in integrating technology in the learning process in order to enhance knowledge and skills.

The interviewed teachers also agreed that by making the teaching and learning more attractive, encouraging and exciting, formulating the smart school policy helped to prepare the students for the greater challenges over time.

From data analysis in this study it was found that identifying the inherent issues and problems during the formulation phase helped the school's authorities to analyze these problems based on the system's needs and requirements. In addition, analyzing the problems enabled the school's authorities to identify possible solutions for addressing the issues.

In this study various problems and issues from different perspectives which related to the formulation phase were identified including teaching and learning materials, technical, financial, and professional development.

In terms of teaching and learning materials most of the identified issues were related to the preparation of the new courseware in CD format and its technicalities; for instance sometimes the teachers want to launch the CD courseware using the laptop but it does not function, or sometimes the Internet connection is disabled or the server is down. On the other hand, some teaching and learning materials also need specific technical skills to make sure that the CD courseware can be used by the teachers.

In terms of technical issues associated with the facilities, the respondents were agreed that the most highlighted problem was related to lack of computer labs and insufficient facilities to cater to all the students. Furthermore, due to heavy usage, some facilities developed technical problems and suffered from insufficient maintenance. Slow Internet connection and accessibility were among the key issues in terms of using technology in the smart school classrooms. Observation of the facilities and computer labs showed that maintenance is difficult given the obsolete equipment and lack of adequate ICT technicians and officers in some of the schools.

From this study it was found that sometimes problems occur in the application system due to the server error or unexpected failure of the connection of switches. Moreover, the latest management system was still on trial so the school had to use the server in order to save the school's data files. The other issue mentioned by the interviewees related to the need for regular upgrading of the facilities for maintaining and serving the main server which provide services to the large numbers of computer users at school.

Another issue identified was the problem of insufficient facilities in the crowded classrooms. The teachers interviewed agreed that the large number of students (approximately 35-40) in a class required a lot of preparation before letting them use the computers and the Internet in the computer labs.

In terms of professional development, this study found that the main issue was related to the new teachers' training programs. This problem was due to the newness of the technology usage for some of the new teachers. The interviewees agreed that in terms of professional development there is a need to have more regular training programs specifically for the new teachers and also re-training programs for updating existing teachers.

In terms of financial issues, the majority of participants agreed that for the effectiveness of the smart schools activities, there is a need for consistent financial support from the authorities such as the Ministry of Education. They respond that all the problems related to ICT services and maintenance of the system will be addressed if the government provided them more financial support as well as more ICT officers and technicians to take care of the ICT department and also to conduct regular maintenance of the IT equipment.

B. Implementation Phase

This study found that the most important principle for implementing the smart school policy is that the policy must cater for the benefit of the target group at large. It means that the policy implementation should be beneficial for the majority of the people who face the policy, not just for the minority group. On the other hand, a policy should address the underlying problems so that it has a high chance of success and can be extended for a longer time. Therefore, accounting the possible expenses and profits of the policy in a proper manner was among the key issues that needed to be considered in the implementation phase, although benefits sometimes are intangible and must be estimated.

From the data analysis it was found that pre-implementation assessment on the school's status helped the administration and management team to gather useful information on making assumption about the policy of smart school. Moreover, it also

helped to avoid possible errors in the implementation phase.

Similar to the formulation phase, successful implementation of the smart school policy also needed the full support of the government agencies to provide the facilities such as the Internet services and its regular connectivity, and accessibility. Consistent support of the authorities could help the smart schools maintain their system for better performance. Apart from the government, the other financial support to the case school was from Ministry of Education, as well as the community agencies, and the parents.

C. Monitoring Phase

In this study in order to find in-depth data on the monitoring phase of the smart school policy, the findings were categorized from three different perspectives including administration and management team, teachers and the ICT coordinator and technician. The following sub-sections elaborate on these perspectives:

C.1 Administration & management team

From the analysis it was found that the administration and management team's attempt at setting up a working group was an effective strategy to monitor the performance of the entire school's system. Moreover, the working group also had the responsibility of implementation of a road map in addition to the numbers of criteria for the school's performance measurement. In terms of monitoring the ICT utilization by teachers and students the main management strategies was direct observation of the classrooms as well as monitoring the teachers' log-book and record book, use of computer labs, and ICT equipments.

The main benchmark for the administration and management team to monitor the performance of ICT usage by teachers and students was online evaluation of student's performance as well as their results and also online evaluation of teachers' comments and opinion about the role of ICT in their teaching performance.

This study found that in order to encourage teachers to utilize ICT in their teaching process, the key strategy of the administration and management team was to plan and organize the in house (inside school) training for the new teachers as well as re-training programs for the senior teachers. The main objective of these programs was to enhance the teachers' knowledge and skills on using computer as well as efforts to facilitate with ICT equipments.

C.2 Teachers

The analysis showed that in teacher's perspective, the main benchmarks to monitor the students' performance in using ICT for learning was

to observe their online participation in the related topics. The other benchmark was to monitor the impact of using multimedia techniques for the purpose of presenting teaching and learning materials in the process of each individual learning.

This study found that there are not planned and organized training programs for the students in terms of using computers, the Internet and other facilities. Apart from teaching ICT subject for the students in form one and two the other methods for them to learn the ICT skills is in the classroom, in the computer lab, or while doing school's projects with their peers.

In order to monitor the role of ICT in teaching and learning process, the students will be given some school projects that integrate the ICT skills with the contents of the subject. The teachers assess the students' performance based on the criterion reference method. However, the main objective in the monitoring phase was to encourage teachers and students to use ICT as much as they can in preparing and producing teaching and learning materials.

C.3 The ICT Coordinator & Technician

Monitoring the maintenance of the system in terms of hardware and also updating the software on time is the responsibility of the school ICT coordinator and ICT technician. Therefore they troubleshoot based on the reports made by the administration, management team, staff and the teachers. Internet accessibility and speed of server's performance, service and maintenance of the computers, quality of learning management system, and the quality of teaching-learning materials are the main benchmarks for the ICT coordinator to monitor the performance of using ICT technology at the smart school.

Likewise, in terms of monitoring ICT implementation the benchmark was to monitor the maintenance of the software and hardware, and the cost of equipment's lifetime.

Finally, the benchmark for the role of ICT in improving the performance of the school system was through the Learning Management System (LMS) which mostly generate reports for school managers. These reports were about the success and failure rates of students with respect to the teachers' performance. These reports helped the administration and management team in school, region, district level to set the new policies and strategic planning on objectives of the education system.

D. Evaluation Phase

This study found that in the evaluation phase identifying the weaknesses and strength of the school's performance, helped the administration and management team to enhance the total outcomes of

the system. Majority of the participants agreed that in the final phase of the smart school policy, the main benchmarks for the role of ICT in improving the performance of the school's system was students' achievement and performance not just in terms of academic performance but the positive attitude in learning, as well as teachers' skills and technology utilization in the classroom. In terms of technical monitoring, it helped the technician to make sure that the system is user friendly with less error.

The interviewees agreed that the smart school's students, teachers, and administration are the most beneficiaries of the smart school policy in terms of ICT utilization in educational system. They also mentioned that in long-term the policy would benefit for the Malaysian society in terms of knowledge and skilled workforce.

The key aim of the evaluation phase of any policy is to assess the benefits of the policy in terms of continuity or discontinuity. The following points are the results of in-depth analysis on the benefits of the smart school policy in terms of using ICT for the Malaysian education system:

- To provide ICT opportunities to everyone and the community. This will help the country to provide the technology skillful workforce for the global market competition.
- To make the learning more interesting and enjoyable for students and motivate them to be more self-managed learners and the teachers tend to be more creative and innovative in their teaching methods.
- To provide the opportunities for students, and teachers to practice new technologies in their teaching and learning processes.
- To help the students for better understanding the subjects through technology facilities and in a systematic schedule.
- To help the students to enhance their knowledge about modern science and technology through practicing ICT facilities by making presentation based on the topic given. From this way of learning the students have enjoyable time learning on how to use Microsoft PowerPoint and it will be easier for them to understand the subjects.

VI. DISCUSSION & CONCLUSION

The smart school policy cycle has been planned and managed to prepare Malaysian students to become knowledgeable and skilled workers for the Information Age. This is in line with the country's key goal of *Vision 2020* [4].

Correspondingly, the main aim of the government in establishing the smart school policy was to democratize education by providing efficient and sufficient facilities in order to enhance individual strengths and abilities.

Previous literature as well as the findings of this research revealed that implementing the smart school policy needs continues monitoring and evaluation in terms of technology performance as well as teacher-student performance. This is because the smart school system as a whole comprises two aspects: the factors related to ICT and those related to technology use by humans.

However, the undertaken studies [8], [13], [15], [5], [3] on smart school policy effectiveness, indicate that the policy is in line with the goals of technology utilization in the teaching and learning process. In this context, the opportunities given to students helped them to enhance and promote creative and critical thinking, self-directed as well as self-managed learning. In a technology-based environment such as the smart school setting, students are prepared to learn in conductive learning surroundings with the resources available to them anytime and anywhere on their own. Such an environment will produce motivated learners who are eager to know more in order to encounter current challenges of the globalization era in their lifelong learning.

Nevertheless, the smart school policy makers and implementers need to consider that technology should not be assumed as a tool to make students “smart”, but the fact is that technology is an enabler to equip the students to think smarter and become more creative.

In conclusion, some recommendations have been suggested based on the findings of this research, as follows:

- There is a need for smart schools to be equipped with adequate computer labs for the comprehensive use of ICT in teaching and learning. This includes providing the appropriate and continuous connectivity and accessibility to the Internet.
- There is a need for continued training programs for new teachers as well as existing teachers at smart schools. This is in order to upgrade their knowledge and skills in terms of ICT usage in their teaching methods.
- Apart from teachers, training programs on ICT usage needs to be extended to students as well. These programs will help the students to be able to determine the direction of their learning, while practicing the applications of ICT in the learning process.

Finally, although a lot has been done to achieve the goals, objectives, and values of the smart school project since its establishment, there are still opportunities for more improvement in the implementation of the smart school policy in Malaysia.

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