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IT Integration and Information Management in Smart School Education System

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INTRODUCTION

1. Information technology and communication plays an essential role in how individuals work, live and learn. Organizations of all sizes rely on computers to operate more efficiency and effectively. People use computers as a tool to access information and communicate with others around the world. For educators, computers and other technologies serve as a tool, which need to seek information in education and to implement new and developing teaching strategies.

2. For educators, integration technology in education is very important. Integration technology is the ability to use computers and other technologies combined with a variety of teaching and learning strategies to enhance students' learning. Integration technology means that teachers can determine how to match appropriate technologies to learning objectives, goals and outcomes.

3. In addition to this matter, a specific curriculum is needed. Curriculum is designed to help students achieve overall balanced development towards integration of knowledge, skills, values and correct use of language across the information age. The Smart School Curriculum is designed according the best practices to incorporate the elements that will enable the education system to achieve the goals of the National Philosophy of Education. Furthermore, technology integration is using technology to help meet the curriculum standards and learning outcomes of each lesson. The curriculum should drive the technology where teachers use the appropriate technologies to enhance students learning.

DEFINITION OF ICT

4. Traditionally, technology is the way people use their inventions and discoveries to satisfy their needs and desires. For this purpose of this paper, the word technology is used as synonym for "information technology" which designed the electronic and digital resources used in an educational.

5. According to UNESCO, information and communication technology (ICT) is defined as a combination of informatics technologies, specifically communication-technology. Informatics technology is defined as the technological application of informatics society. Informatics is the same meaning as computing science dealing with the design, realization, evaluation, use and maintenance of informatics processing systems. It includes CD-ROMs, laser disc, scanner, the internet, LCD panels, digital cameras, copiers, video and any other format to provide information.

SMART SCHOOL: A GENERAL BACKGROUD

6. The Smart Schools Project was started as one of the Multimedia Super Corridor (MSC) Flagship Applications. The smart school is intended to support the MSC in producing knowledgeable workers for the industries within the MSC. The flagship will support the government's plan to obtain the status of a developed nation by the year 2020 and to gain a competitive edge with other developed countries in the global economy. This national project is to build up the human capital for the information age, to reduce the digital divide through various flagships and to increase productivity and

export growth.

7. A smart school will evolve over time, continuously developing its professional staff, its educational resources and its administrative capabilities. This will also allow the school to adapt to changing conditions while continuing to prepare for life in the information age. The objectives of the smart school are:

a. Encourage all around development of the individual covering the intellectual, physical, emotional and spiritual domains.
b. Provide opportunities for the individual to develop his or her own strengths and abilities.
c. Produce a thinking workforce that is also technologically literate.
d. Democratize education do as to provide every child with equal access to learning.
e. Increase participation of parents, community and the public in the education process.

8. The features of the smart school system will encourage independent, critical thought creativity and the ability to care in all students within a conducive environment:

a. Based on a philosophy that "all students can learn if taught".
b. A broad curriculum that takes into account the different capabilities of each student.
c. A school climate that is conducive to learning.
d. Assessment as an ongoing process that supports good instruction.
e. Existence of strong and highly professional from principals and teachers.
f. Community and parents provide a high level of involvement and support.

CURRENT TRENDS IN EDUCATION

09. The information age has given several important characteristic in our school. The information age has further expanded into digitization of huge amount of information. This means that information is now converted into digital form. In this rapidly changing environment, the role of educators has changed from disseminators of a limited knowledge base of information to facilitators of process of accessing and interpreting new information. Educators need to teach the student to be well informed and creative thinkers. The number of available facts will change exponentially in their lifetime but the basic skills of information will remain constants.

10. Technology has opened doors to more information than was available in the traditional school system. The internet and world wide web also provide a richer variety of media including text, graphics, sound, video and animation. It is possible to retrieve information from many remote locations around the globe quickly. When students cannot find the information they need through traditional way, they may search the web using search engine.

11. There is increasing use of internet and world wide web. Numerous projects have made it possible for primary and secondary school children to connect to remote databases, and to their counterparts in other countries. Schools, teachers and students have been able to set up their websites.

12. Furthermore, ICT refers to tool and enablers to make learning more interesting, motivating, stimulating and meaningful to the children. The teaching and learning materials using ICT are designed to accommodate differing needs and abilities, resulting in fuller realization of their capabilities and potential and allowing children to take greater responsibility for managing their own learning. With the help of ICT the pedagogy shall:

a. Use an appropriate mix of learning strategies to ensure mastery of basic competencies and promote holistic development.
b. Accommodate individual learning styles, so as to boost performance.
c. Foster a classroom atmosphere that is compatible with different teaching and learning strategies.

ASPECTS FOR CONSIDERATION IN INTEGRATING ICT AND INFORMATION MANAGEMENT

13. There are some important aspects to consider in the way of integrating ICT into teaching learning process. Policy, professional development, technology coordinator and infrastructure are needed to ensure the successful implementation.

14. **Policy**. Policy areas that need to be addressed when integrating technology into classroom in the smart schools is to envisioned the features of the schools. It has to consider the technological inputs such as local area network, wide area network, hardware and courseware. The common technology standards must also be remaining to the schools for reasons of interoperability.

15. **Professional Development**. Teacher development will be the most critical components as teacher will be the primary delivers of smart school teaching. A comprehensive teacher education programme incorporating best practices in technology supported learning will be success of the smart school. The teachers need an intensive training on information technology skills and technology integration into classroom to enhance thinking and creativity.

ICT INTEGRATION AND INFORMATION MANAGEMENT IN THE TEACHING LEARNING

16. Although computers do not replace teachers, they do change the teachers' role. Technology makes it possible to accommodate a wider variety of learning style, abilities and activities. For example, multimedia provides instructions through multiple sensory, channels by combining several media, including sound, narration, graphics, video, music, animation and text in an interactive manner that allows students to choose their own routes through the information.

17. Educational in the last twenty years was the universal. Teaching was based on information retention, memorization, and standardized procedures and testing. Students are passive learners. Now a days, the role of teacher has change from presenter to facilitators, mentor, resource allocator, coach and collaborator. With the use of technology, teachers can accommodate different individual learning styles and abilities more easily.

18. Integrating technologies into classroom have many ways to adapt. Multimedia applications, computer based training (CBT), entertainment and edutainment and the world wide web are the examples of technology applications that can used in teaching learning environment in Malaysian smart school educations[1].

19. **Multimedia Applications**. A multimedia application involves the use of multimedia technology in education. Teachers use multimedia applications to deliver classroom presentations that enhance students learning. Mean while, students use multimedia applications to learn by reading, seeing, hearing and interacting with the subject content. Multimedia simulations often replace costly and sometimes risky demonstration and training in areas such as chemistry, biology or physics.

20. **Computer Based Training (CBT)**. Computer based training (CBT) is a tool which individuals learn by using and completing exercises using instructional software on computers. According to Wikipedia Encyclopedia, Computer-based training (CBT), also called computer-assisted instruction (CAI) is a type of education in which the student learns by executing special training programs on a computer.

22. **Entertainment and Edutainment**. According to Wikipedia, the free encyclopedia (http://en.wikipedia.org), edutainment (also educational entertainment or entertainment-education) is a form of entertainment designed to educate as well as to amuse. Edutainment typically seeks to instruct or socialize its audience by embedding lessons in some familiar form of entertainment such as television, computer and video games, films, music, websites, multimedia software, etc.

23. **Projects Assessments**. In the new classroom environment, technology advances make it possible for students to create project instead of taking paper and pencil[2]. They can create more polished projects using presentation software like Power Point. Students can create computer generated graphs and charts to give their project credibility.

INFORMATION MANAGEMENT IN SMART SCHOOL ENVIRONMENT

24. The Smart School Pilot Project introduced a computerized Smart School Management System (SSMS) to the Pilot Schools. This system allows for complete school monitoring by senior administration. It also facilitates e-communication between teachers and students. The traditional curriculum may be enriched with the use of software resources available through the SSMS.

25. This integrated information management software covers nine areas of school management, namely, Financial, Student Affairs, Educational

Resources, External Resources, Human Resources, Facilities, School Governance, Security, and Technology.

APPLICATION OF INTEGRATING TECHNOLOGY IN THE CLASSROOM

26. How can technology contribute to classroom teaching and learning? In order to understand its application in the classroom, it is important to know how the technology assists teachers and learners organize and manage teaching and learning respectively.

27. **Teacher Perspective**. From the teachers' standpoint, the technology enables them to handle different kinds of materials for teaching in the classroom. This ranges from the one-way presentation of information in the form of texts and graphics to the more sophisticated audio-visual types. In addition, the teachers can also use the computer for an example to manage instruction by treating it as a personal tutor. For instances, the computer can be used for engaging students in drill based practice and simulation activities.

28. **Learner Perspective**. Technology provides for efficient use of drill and practice, which are essential for learners. When the learners have acquired a reasonable degree of competence, they can advance to higher level task which requires some form of limited interaction with the computer. Simulation games for an example, are not only motivating, but also encourage social interaction[3].

BARRIERS AND CHALLENGES

29. Barriers and challenges in integrating technology in teaching learning environment is no exception. Several barriers have hindered technology integration in many schools. Such barriers include a lack of teacher training in ICT, computer placement, which make difficult for teachers to have access to the technology.

30. **Budget Constraints**. The main barriers to implementing technology in the classroom were lack of financial resources. Many forms of educational technology, in particular computers, require large expenditures every three to five years. At present, many school district lacks of sufficient financial resources to incorporate technology.

31. **Lack of Teacher Training**. Some teachers fear in using technology. Some of them use trial and error and in some cases, they have learned from students. For many teachers, a lack of personal experience with technology, presents an additional challenge. In order to incorporate technology-based activities and projects into their curriculum, those teachers first must find the time to learn to use the tools and understand the terminology necessary for participation in those projects or activities.

32. **Computer Placements**. There are two questions to be considered which are about the placement. Do students or teacher have easy access? And second one about portability. Can computers be moved? Before the students enter the class, teachers make an important decision regarding how computers will be used in their class. Computer placement has a dramatic impact on when and even if students will use the computer. What is the best placement for computers in the classroom? Select a central location and arrange the computers so the students can see the monitors from various points throughout the classroom. Position the computers, then move to various centers, and check at a students' height to ensure the monitors are visible from most of the classroom.

33. **Hardware Theft and Vandalism**. For schools, hardware theft and vandalism present a difficult security challenge. To help minimize the theft of technology such as computers and associated equipments, schools can implement a variety of security precautions.

34. **Information Theft**. Information is a valuable asset to an organization such as schools. The deliberate theft of information causes as much or more damage than the theft of hardware. Even though, information theft is not a major problem in schools, the potential is taken seriously because school networks do contain a great of important and confidential information on students, teachers and staff.

CONCLUSION

35. The Smart School project is a critical platform for building the right skill base human resources to take Malaysia into the next step to achieve Vision 2020. This concept are not merely putting hardware in schools but also getting appropriate technology which is easily integrated and web-based, providing proper training, and running practical applications. The task is indeed daunting and time consuming. With proper planning, positive feedback, continuous support and guidance, the nation's knowledge workers as part of the drive to achieve Vision 2020 can be produce.

36. ICT integration and information management in Malaysian smart school education has throws up enormous opportunities and challenges. The technology is seen like a 'vitamin' that present for better educational outcomes. The concept of ICT in education includes systems that enable information gathering, management, manipulation, access and communication in various forms. The role and function of ICT in the classroom is seen as a teaching and learning tool that enable to make learning more interesting, motivating, stimulating and meaningful.

RECOMMENDATIONS

37. The new learning environment differs from the one that schools community familiar with; the teacher has to cope with many uncertainties. Because of the rapidly changing learning environment, teachers should be conscious of the fact that the skills they acquired, in their own training, reflect the current state of affairs. Richly ICT designed learning situations are needed for Malaysian education. Built on this principle, the Malaysian Smart School Projects attempt to reinvent the teaching learning process in an effort to meet the country broader goals of transforming from a predominantly industrial economy into a knowledge economy.

38. **Create Knowledge Portal about SSMS**. SSMS knowledge portal can be a single reference for knowledge storage, search and dissemination of SSMS within the school. Normally it works on the intranet. Modules, notes or any documents that are related to SSMS can be kept in the knowledge portal for easy retrieving and sharing. ICT coordinator or IT technician should update this knowledge portal frequently.

39. **Create Knowledge Sharing Practice**. The school administrator can help to lead by example, by promoting and cultivating knowledge sharing culture. The knowledge practice strategy must be designed according to SSMS goals, mission and vision. The school principal has to take the lead knowledge sharing activities. For example, principal who has regularly attended meeting, workshops on SSMS should share the documents, notes or modules that he acquires through meetings and then should be placed in SSMS knowledge portal to allow knowledge sharing.

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