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Designing and Organising Successful Continuing Professional Development Training (CPDT) for Science Teachers in High Performing Schools: Implementing Instructional Technology (IT) Integration Effectively in Malaysia

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ABSTRACT

Successful Continuing Professional Development Training (CPDT) is one of the crucial aspects in ensuring the effectiveness and efficiency of Malaysian science in integrating Instructional Technology (IT) integration in science classrooms of Malaysian High Performing Schools (HPS). Undeniably, CPDT may take several years to accomplish educational changes such as curriculum innovations. Based on qualitative semi-structured interviews and observations conducted with five (5) science teachers and administrators who participated in this study, many issues pertaining CPDT emerged that help design training in the future. This paper reports the findings of research study involving science teachers. Not all the teachers involved in the study underscored the value of the CPDT, but it is vital to highlight some important points pertaining to CPDT attended. The teachers in this study felt that some of the work given during the training was often interrupted due to lack of IT competency in other participants. Undoubtedly, teachers with widely differing IT skills affect the performance of the group psychologically, as those who are not skilled may mistakenly be considered as weak teachers. There are some recommendations given to help improve the CPDT designed and developed by Ministry of Education: (1) Before sending teachers out for training, it is crucial to perform a basic needs' assessment of their general, specialised and technical skills; (2) CPDT should be attended by teachers with similar levels of IT skills; (3) Teachers should be divided into groups based on their levels of IT skills; and (4) CPDT should be conducted as an ongoing series of CPDT courses and (5) CPDT does not have to be a residential programme. It is important to realise that educational changes expected is a journey, not a product of implementing change in schools.

Keywords: Teachers, Instructional Technology, Science

INTRODUCTION

There have been lots of Information and Communication Technology (ICT) development in Malaysian schools, from the introduction of Malaysian Smart Schools (from 1999-2010) and the enculturation of smart teaching and learning through High Performance Schools (2010 onwards). Every country around the world always try to take advantages of ICT and Instructional Technology (IT) tools as they realise the importance of IT in increasing productivity of teachers and students (Sahagun & Bueno, 2019; Collin & van der Heijden, & Lewis (2012). Malaysia too, has become an advanced country through change and development. Various initiatives have been taken by the government to ensure that our country continues to develop innovatively, competitively and comparably with other countries in the world. High Performing Schools are defined as effective schools with ethos, character, identity and unique in all aspects of education and able to compete on the world stage (MOE, 2013).

The main objective of the MOE is to place all the HPS as a benchmark in terms of educational excellence and a model to all other schools in the country. Only 88 schools were selected from more than 10,000 schools in Malaysia (MOE, 2013). The Ministry of Education (MOE) ensures that leaders who are appointed from these schools are knowledgeable, skillful and competent; the International Society for Technology in Education (ISTE) and the Partnership for 21st Century Skills pushed for a renewed importance on technology in education in a recent national report (SETDA, 2007). It is stated that "we must leverage [technology] to provide engaging and powerful learning experiences, content, and resources and assessments that measure student achievement in more complete, authentic, and meaningful ways" (U.S DOE, 2010, p. 3). CPDT is crucial in ensuring success of IT integration in schools (Yuan Chen & Jing Peng, 2019).

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The Ministry of Education (MOE), particularly, the Educational Technology Division has spent lots of money and organized lots of training programmes and initiatives such as ICT and Instructional Skills (IT) skills training in order to prepare students as quality human capitals in the future. Teachers' Activity Centres of MOE (Pusat Kegiatan Guru) work closely with the respective State Education Department and District Education Offices to design and organize Continuing Professional Development Training (CPDT) in order to keep abreast of any new ICT development and educational changes expected by MOE. MOE (2013) has specifically explained what roles should IT play in promoting students engagement and interaction among teachers and students. Successful Continuing Professional Development Training (CPDT) is one of the crucial aspects in ensuring the effectiveness and efficiency of Malaysian science in integrating Instructional Technology (IT) integration in science classrooms of Malaysian High Performing Schools (HPS) (MOE, 2013). Abdul Halim's findings reveal the most frequently cited barriers to technology use were a lack of developmentally appropriate software, funding issues, time constraints, and inadequate technology skills (Abdul Halim, 2006).

All current CPDT programmes by MOE agencies are intended to bring new changes to the ways teachers ordinarily teach in their classrooms and maximise the integration of ICT in classrooms. As a catalysts for achieving Vision 2020, the technology-supported training would be one of the ways to help achieve the National Philosophy of Education (NPE) and foster the development of a work force prepared to meet the challenges of the twenty-first century skills. Training developers need to look into teachers' skills in enhancing three forms of literacy: technological literacy, information literacy and visual literacy (Roblyer & Doering, 2014). After undergoing training, teachers are expected to change their roles as controllers or givers of knowledge to facilitators and to make their classrooms to be more student-centred. Teachers need to adopt constructivist approaches to enhance students' cognitive skills. Cognitive skills can be developed if the teaching strategies are "active and pupil-centred" (Hudson, 1994, p. 97).

Approaches using constructivism should have six elements:

*Teachers develop the **situation** for students to explain, select a process for **grouping** of materials and students, build a **bridge** between what students already know and what they want to learn, anticipate **questions** to ask and answer without giving away an explanation, encourage students to **exhibit** a record of their thinking by sharing it with others and solicit students' **reflections** about their learning.* Gagnon dan Collay (2001, p. 2)

Once equipped with appropriate knowledge and skills through CPDTs, Malaysia teachers are expected to be able to integrate IT (tools) into their teaching of concepts of learning. Teachers should not only be able to provide effective instruction but also to ensure that their presentation of lessons is of sound quality. Teachers should encourage and engage learners with Higher-Order Thinking Skills (HOTS) and Problem-solving skills. We are aware that schools are not just about using ICT in teaching and learning. CPDT must be able to educate teachers to make informed decisions before using appropriate IT tools in their classrooms and to motivate students, present interesting lessons, assess fairly and help their students learn effectively.

Despite training teachers to use ICT and 21st century skills, teachers are still weak in integrating ICT into their teaching practices (Abdul Halim, 2006). Lots of factors have been considered hindrance for teachers to fully integrate ICT into teaching and learning. Despite the availability of ICT facility, some of the reasons why they continue teaching without integrating extensively are as follows:

1. Requirement of finishing the syllabus in time for public examinations;
2. Many topics to be completed before the public examinations;
3. Varying capabilities among students (a variety of students' individual differences);
4. Insufficient knowledge on students' individual differences;
5. More experiments, more teachers' talk;
6. Less interactions between teachers and students;

CPDT programmes should be a continuous programme, not a one-off programme that keeps teachers motivated to teach and provide effective instruction to students. Therefore, teachers after undergoing the training should also be monitored and assessed periodically. Any CPDT that is developed should be used to enhance teachers' personal, subject as well as learning and teaching competence in integrating IT tools. The integration of IT enables students to practice self-paced, self-accessed and self-directed learning that allows some flexibility of learning based on the capability of individual students. The availability of IT does not guarantee the effectiveness of teaching if teachers do not know

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how to use them effectively. Regardless of the availability of IT and the sophistication of technology equipment, the effectiveness of IT depends on teachers' skills in IT integration.

With the advancement and development of ICT, CPDT programmes should be geared to bring the effect the technology transfer form advanced nations and to build up local technology through Research and Development (R&D) within the Multimedia Super Corridor (MSC). ICT is not considered as a cure for all educational problems. In spite of ICT as an enabler, teachers always will be more important than technology. Teachers may not be capable of keeping up with ICT changes and development. As new ICT tools are introduced, "*older technologies are still relevant and more useful*" (Roblyer, 2014, p. 20).

Training of teachers must be carefully developed and designed to allow teachers to integrate instructional technology or ICT. According to Roblyer and Doering (2016), integrating instructional technology "*refers to the process of determining which digital tools and which methods for implementing them are the most appropriate responses to given educational needs and problems*" (p.16). To take advantages of ICT advancement and change, CPDs should be able to focus on skills teachers require to bring about "three different levels of human capacity development: technology literacy, knowledge deepening and knowledge creation" (Roblyer and Doering, 2014, p. 31). Moreover, CPDT programmes are designed and delivered "*to move away from memory-based to an education that stimulate thinking, creativity, and caring in all students, caters to individual abilities and learning styles and is based on more equitable access*" (MOE, 1997, p. 9). Besides ICT skills, teachers must also teach metacognition or focus more "learning to learn" skills, such as thinking creatively and reasoning effectively, than on memorising facts, definitions and rules (Roblyer & Doering, 2014, p.36).

The CPDT should be aimed at producing enable the life-long professional development of teachers who are honourable, knowledgeable, creative and resilient through a comprehensive curriculum that not only provides the content knowledge but also the skills that are essential for the facilitation of learning and of good moral behaviours at the school level.

The study is conducted to meet the following objectives:

1. to document teachers' uses of Instructional Technology (IT) tools in science classrooms and
2. to investigate how could CPDT programmes be improved in enhancing Instructional Technology (IT) skills;

The research questions are:

1. What types of Instructional Technology (IT) tools are being integrated into science classrooms?
2. How could their CPDT be improved to enhance science teachers' Instructional Technology (IT) skills?

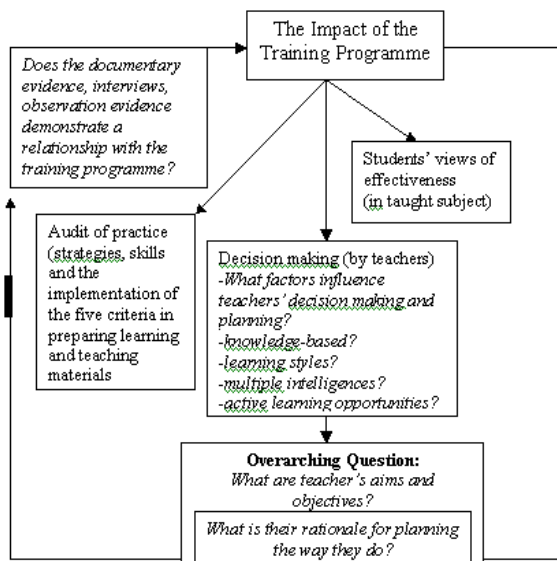


Diagram 1: Research Overview

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RESEARCH METHOD

In probing teachers' skills in ICT and 21st century teaching and learning skills, three methods were used to collect the data from eighty teachers involved. Questionnaires, semi-structured interviews as well as observations to help gather the data concerning the effectiveness of CPDT programmes attended. The questionnaires were given to 18 science teachers in 6 High Performance Schools (3 teachers per school) and semi-structured interviews were carried out to understand how they did they make their decisions in terms of using IT as a tool in classrooms.

The questionnaire was used to find out as much as information on the training they attended. It was used to gather information about teachers' experiences and their confidence in the integration of IT into their lessons. Teachers' uses of IT and their CPDT programmes attended, knowledge on IT skills and their attitudes in IT integration.

Carrying out this study involving teachers could be difficult, especially getting them to talk about educational policy and teaching practice. Together with observation and survey, I used interviews as a flexible way of getting "a rich source of data" (Silverman, 2001, p. 114). Kvale (1996) describes "interview as a way of bringing together multiple views of people" (cited in Barbour and Schostack, 2005, p. 43). Patton (2002) states that at interview:

"[o]pen-ended questions and probes yield in-depth responses about people's experiences, perceptions, opinions, feelings, and knowledge. Data consist of verbatim quotations with sufficient context to be interpretable" (p. 4).

Patton (1980) recognises three types of interview: informal conversational interview, the general interview guide approach and the standardised open-ended interview (cited in Punch, 1998, p.175). In-depth interviews are useful in probing individuals' experience and interpretation of experience (Patton, 1990).

Sanger (1996) considers interviewing one of the most significant methods of observation and documentation. The power, social position, value, trust, meaning, interpretation and uncertainty "problematise interviewing as a natural way of 'getting' the data" (Barbour and Schostak, 2005, p. 42). Mason (2002) refers to qualitative interviewing as "in-depth, semi-structured or loosely structured forms of interviewing" (p. 62). She considers that "qualitative interviewing therefore tends to be seen as involving the construction or reconstruction of knowledge more than the excavation of it" (p. 63). In order to collect meaningful knowledge during qualitative interviewing, Mason (2002) suggests that researchers need to do the following: make sense to, or be meaningful to, the interviewees; relate to interviewees' circumstances, experiences and so on, based on what they already know about them; be sensitive to interviewees' needs and rights, in accordance with the researcher's ethical position and moral practice; help the flow of the interview interaction – the 'conversation with a purpose' – rather than impede it; and ensure an appropriate focus on issues and topics to the research questions (p. 74).

Observation can be categorised as five paradigms: formal sociology, dramaturgical, studies of the public realm, auto-observation and ethno-methodology (Adler and Adler, 1994). Mason (2002) refers to observation as:

"methods of generating data which entail the researcher herself or himself in a research 'setting' so that they can experience and observe at first hand a range of dimensions in and of that setting. These might include: social actions, behaviour, interactions, relationships, events as well as spatial, locational and temporal dimensions" (p. 85).

Patton (2002) views observations as:

"fieldwork descriptions of activities, behaviours, actions, conversations, interpersonal interactions, organisational or community processes, or any other aspect of observable human experience. Data consist of field notes: rich, detailed descriptions, including the context within which the observations were made" (p. 4).

Patton (1987) relates four advantages of observations: gaining an understanding of the context of the activity; allowing for an inductive approach by engaging in a first-hand experience; seeing things of

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which others may not consciously be aware; and learning about things which the participant may not be willing to discuss.

LITERATURE REVIEW

The success of students depends on teachers' attitudes, knowledge and skills in utilizing new tools such web 2.0 where teaching involves communication and collaboration among peers. Teachers are expected to be trained as "guides on the side" and to move away from memory-based teaching to new kind of learning where 4Cs (Communication, Collaboration, Creativity and Critical Thinking skills) are celebrated in classrooms. It is hoped that classroom activities can "*stimulate thinking, creativity, and caring in all students, caters to individual abilities and learning styles and is based on more equitable access*" (MOE, 1997, p. 9). They are expected to make changes to the way they teach, adapt and adopt new teaching approaches, use ICT and/or the Internet as an educational tool, use a variety of teaching materials and assess students fairly based on their individual performance.

Continuing Professional Development (CPD)

With the advancement and development of ICT, teachers' Continuing Professional Development Training (CPDT) programmes should be geared to bring the effect the technology transfer form advanced nations and to build up local technology through Research and Development (R&D) within the Multimedia Super Corridor (MSC). CPDs are designed and delivered "*to move away from memory-based to an education that stimulate thinking, creativity, and caring in all students, caters to individual abilities and learning styles and is based on more equitable access*" (MOE, 1997, p. 9). The current training programmes are aimed at producing knowledge workers to operate the nation's high-tech industries in the 21st century.

It is expected teachers who are trained well with ICT skills help build up a highly competent workforce who are able to create new products and processes. Classroom practice will therefore focus on inquiry, discovery of knowledge and understanding, development processes and the design and creation of products. A practical emphasis as well as research, information gathering, design and production are some aspects to be implemented in classrooms. Undoubtedly, success cannot be achieved overnight as teachers need a gestation period to be comfortable with the ICT skills and the 21st century teaching skills.

Pedagogy

Teachers need to be flexible in their pedagogical approaches to enhance student engagement and interactions among their peers and teachers as well as content area materials. Teachers upon gaining new attitudes and knowledge can enhance their pedagogy and create better student engagement. A variety of pedagogy can certainly make learning in classrooms more interesting, motivating, stimulating and meaningful, involve children's minds, spirit and bodies in the learning process. Pedagogy in the 21st century should *use an appropriate mix of learning strategies to ensure mastery of basic competencies and promote holistic performance, accommodate individual different learning styles so as to boost performance and foster a classroom atmosphere that is compatible with different Learning-Teaching strategies*" (Government of Malaysia, 2001, 2012). The new learning and facilitation should bring about a systemic change in education, from an exam-dominated culture to a thinking and creative knowledge culture as well as to equip students with ICT skills and competence in order to prepare school leavers for the Information Age.

Teaching Materials

With CPD training, teachers are to design and develop their Learning-Teaching materials to cater for a variety of learners with different abilities. Equipped with knowledge on teaching and teaching and learning materials, teachers should play significant and effective roles in enhancing student learning and increase student achievements. Teachers are encouraged to develop and use their old and new teaching strategies in order to accommodate students' differing needs and learning abilities. Furthermore, cognitively challenging and motivating materials may give options to teachers to produce knowledge workers in the future (MOE, 2015). Besides stimulating the students' minds, the materials should be used to encourage students to be independent learners and take greater responsibility for managing and directing their own learning.

Assessment

MOE expects teachers to use a variety of activities to assess students' different abilities and skills. It is crucial for teachers to assess their students only when they are ready. Assessment in schools is being

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made distinctly different as students' individual differences and multiple intelligences should be considered in preparing lessons. Teachers are expected to be sensitive to individual differences among students. There is a movement from norm-referenced assessment to criterion-based assessment that gives opportunity to all learners to progress at their own pace. The uses of various methods can certainly help teachers in assessing students and provide a more complete and meaningful picture of a student's ability. In the long term, a student's performance in school level assessment will be combined with a centrally administered examination for the final performance report. It is noted that *"learner-centred assessment is a flexible system of assessment which is administered on an individual basis"* (Government of Malaysia, 1997, p. 52). To cater for students' differences, *"multiple approaches and instruments are used to assure the quality of assessment and to provide more holistic and accurate picture of a student's performance"* (Government of Malaysia, 1997, p. 11).

IT Integration in Classrooms


To function effectively in schools, CPDs prepare teachers to have curricular, school and content knowledge and to be critical as to when and how to integrate ICT into their subject curriculum. Teachers need to be skillful in integrating ICT into teaching and learning. Integrating technology is *"the process of determining which electronic tools and which methods for implementing them are appropriate for given classroom situations and problems"* (Roblyer and Edwards, 2014). It is also known as *"the combination of technology and traditional teaching procedures to produce student learning"* (Merill et al., 1996, p. 273).

Integration of ICT requires teachers to be prudent and to encourage them to make important decisions before teaching. Teachers' knowledge on theories of learning and teaching is significant to their teaching practice. This is crucial as *"teaching requires you (teachers) to transform the knowledge you (they) possess into suitable tasks that promote learning"* (Capel et al., 1998). Teachers' professional knowledge, professional judgement and subject knowledge are three important areas that affect teachers' performance and effective pedagogy in the classrooms (Capel et al., 1998). All in all, teachers' pedagogy must be based upon the attainment of clearly defined single instructional objectives within an instructional framework (Hallam and Ireson, 1999). They need to consider what teaching strategies to use after making careful analysis of their learners, learning environment and learning activities.

RESULTS AND DISCUSSION

As stated earlier, this study uses three methods - questionnaires, semi-structured interviews as well as documentary analysis to gather the data concerning the effectiveness of ICT training attended. The questionnaires documented certain ICT tools used in their classrooms.

Table 1 Teachers' Responses on the Frequency of Use of Instructional Tools

	Students' Responses in the Questionnaire
frequently used daily/almost daily  Least frequently used Daily/almost daily	Blackboard/ Whiteboard (94%)
	Textbook (88%)
	Workbook (61%)
	Overhead projector (OHP) (26.5%)
	Photograph (26%)
	Computer-assisted instruction (CAI) (14%)
	Models (12%)
	The Internet (12%)
	Slide projector (9%)
	Flipchart (4%)
	Newspaper (3%)
	Television (2.5%)

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	Video (2%)
	Radio (0.4%)

Table 2 Teachers' Questionnaire and Observation of Teaching Methods

	Teachers' Responses in the Questionnaire	
frequently used daily/almost daily	Discussion (88%)	
	Lecture (79.5%)	
	Problem-solving (62%)	
	Drill and practice (58%)	
	Tutorials (42%)	
	Simulation (29%)	
	Students' presentation (25%)	
	Role play (12%)	
	Least frequently used daily/daily almost	Game/adventure (0%)

The open-ended questions in questionnaires reveal some of the problems of integrating ICT into teaching and learning:

- a. Syllabus – too many topics to be completed;
- b. Lack of time – too many things to do, prepare and mark test questions;
- c. Lack of computers in a laboratory – cannot use it regularly;
- d. No computers in the classrooms;
- e. Expectations of parents – want their students to get as many A's as possible;
- f. Expectation of the head teachers – excellent schools that produce excellent results;
- g. Insufficient exposure on practical ICT integration;
- h. Insufficient ICT skills to integrate ICT confidently;
- i. Difficulty in finding teaching and learning materials;
- j. Poor network connection and system breakdown – slow to set up;
- k. Less ICT used due to insufficient skills of ICT;
- l. Inconsistent or no monitoring of teachers' use of ICT;

Based on the semi-structured interviews, three themes emerged from the data: (1) Challenges faced in schools; (2) Role of teachers as facilitators; (3) Facilitating learning and (4) Follow-up training.

Challenges Faced in Schools

As the teachers have all been trained to teach in smart schools, the MOE has high expectations of them. They want the teachers to accept the challenges and try to adopt as many as possible teaching strategies suggested during the training. They should always try to upgrade their knowledge and be able to deliver whatever that they feel useful for students. They should be sensitive to students' individual capabilities and needs. It is also their duties to understand their learners and maximise students' potentials. The teachers must always try very hard to ensure that they carry out their duties as best as possible. During the fieldwork, we would like to find out what kinds of challenges the teachers

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were facing when they were asked to teach using current school's curriculum and training. We had the opportunity to ask the teachers to tell me what the challenges were.

As a head of science, Nair says that *"I don't feel any different teaching here. I need to accommodate to the new ICT environment. I need to be learning new teaching and learning tools, worksheet, materials prepared to accommodate different students' learning styles, technical (computer) problems."* [nair/int/12.4.19].

Fauziah thinks that *"teaching now is more difficult as students are exposed to many media. There are multimedia resources and the Internet. Students have been exposed to many different skills. The teachers have been very creative and daring in bringing about changes. There are many resources that teachers could use to improve their knowledge. I am certain that the curriculum would encourage teachers to be creative and innovative"* [fauziah/int/19.4.19].

Another teacher says that the challenges he faced are *"Limited time and needs, I don't feel that I am up to face the challenges"* [nair/int/15.4.16]. Smart teaching could be implemented if teachers start to realise the importance of the needs to teach effectively. Azizah states that *"smart teaching as one of the factors to increase teaching effectiveness, teacher as important factor as guidance"* [azizah/int/22.2.19].

Suzan feels that *"it is a brave effort to move the country forward. The use of ICT and other skills are crucial in developing important citizens. The current ICT training can be used to produce ICT competent workers for the 21st century. It is also crucial for teachers to appreciate students' creativity"* [suzan/int/20.2.19].

Angie predicts that *"students and teachers will need to work hand-in hand. They should be working interdependently. The students are expected to be responsible for their own learning and the teachers should be able to provide and search more meaningful materials for the students. It is useful to have students who are responsible and I hope the "smart" students can achieve better with the help of teachers"* [angela/int/24.2.19].

Role of Teachers as Facilitators

During the interview sessions we have had with the teachers, they told us that they have been asked to make their classroom more student-centred. During training, they had been urged to play their roles as facilitators and could help make their classrooms more conducive for learning and their science lessons to be more interesting. The roles as facilitators could certainly help the teachers to be closer to their students. Teachers as students' mentors, the students would be able to work together with them to produce excellent students' performance. As the ex-head of science, Nair says that *"(t)he teachers as facilitators should try to provide help whenever necessary to improve students' performance and the grades in science. Keeping in mind the learners, they need to plan lessons as effectively as possible. They need to develop the atmosphere for learning and make students the focus of their teaching and learning. In this class, students will be at ease in learning science and retain as much information as possible"* [nair/int/12.4.19].

In our interview with Nair, he expresses that *"in the classrooms, I always play the role of a facilitator. The teachers' roles as facilitators are not something new. In my opinions, teachers should be students' peers and counsellors. The students have long been taught this way in my class. Therefore I welcome the move by the ministry. I have no problems regarding playing my role as a facilitator. It suits me well. It is suitable with my styles and helps in my teaching process. I don't like to teach if my students are afraid to ask question and contribute their ideas. I prefer my students to be active learners in my classes and contribute their ideas in my class. I want my students and I make the classroom alive. Certainly I would be very tired if I am the only one talking"* [nair/int/12.4.19].

Nair claims that *"the role as facilitator suits me well. I feel that students should not be afraid in learning. Teachers are there to help. I always encourage my students to ask questions and work as a team. They must make sure everybody pass the subject with flying colours. Not everybody is brave to ask questions, most of them are shy. I don't give up easily. I get them to do group work to get them to participate in my class. I try to organise small activities and games whenever I can but I am afraid that if I spend more time doing games, I am not able to finish the syllabus on time. I change my role whenever I feel necessary. If I am not serious, students may misunderstand me. This would be posing more problems as their teacher"* [nair/int/12.4.19].

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Another colleague of Nair, Abu feels that the role as facilitator is very useful in his classroom. However, he elaborates that “not all students are well-disciplined when they should be independent. I have to remind them all the time to do things on their own before copying their friend’s work. They need to try first. I always welcome students to teachers’ room and give them help whenever I can. For students who are faster learners, they will be given more exercises. To the weak students, I provide tutorial lessons” [abu/int/15.4.19].

Fauziah, who had been working for 5 years, says that “the role as facilitator is very relaxing. It is one of the ways to reduce stress among teachers. Teachers are as students’ friends. I like to be facilitator. I would try to help my students whenever I can. I want to be students’ friend and be there whenever I can. I want to help them pass the science subject. I try to be their close friend. I think students enjoy learning science with teachers who are friendly. I try to be flexible and try to cooperate when learning science. In my class, my students always contribute ideas in my class” [fauziah/int/19.4.19].

She continues that “as a facilitator, I always ask them what they want to learn and try to see if their ideas fit to my syllabus. If we play and play games in my lessons, I don’t think I can finish the syllabus. I will get into trouble if I don’t finish the syllabus on time. I like to conduct activities with my students if they behave well and read what they have been asked to read” [fauziah/int/19.4.19].

Suzan who has been working in the school for 8 years, asserts that “I don’t like my students to be afraid of me. I want my students to take part in my class discussion. My role as facilitator... I want to be their friend. I want to help as much as I could. I always get my students to participate in my class. I consider that teacher and students should be there for each other. I have no problem being a facilitator in my class” [suzan/int/20.2.19].

Angela states that being a facilitator, “building rapport with students is crucial. I should try to get students to take part in my lessons. I always welcome their contributions. But, not all students want to participate. Many of my students are afraid to take part as they need to speak in English. In year 7, English is used in Science. Can you imagine if they are forced to ask questions? I think it takes time. I try to use English and the Malay language (known as Bahasa Malaysia) in my science. If I use English throughout my lessons, maybe not everybody understands it. If I use the Malay language, it means that I am not following ministry’s directive, I will be in trouble. If I ask a student to say something, he or she will be quiet. I think it is difficult now when I teach Year 7” [angela/int/24.2.19].

Azizah who has been teaching Science for nearly 9 years feels that she always tries to play the role as facilitator too. She faces the similar problems, trying to get her students to cooperate with her. According to Azni, “my role as facilitator, yes, I think I try to be their facilitator. I think my students know that I always want them to cooperate and take part in my discussions with them. They like to work in groups. To take part, it is a bit difficult. They do not want to be put on spotlight. They are shy. I do wait to get them to take part but they are shy. I cannot just wait for them. I have my syllabus to complete and students have to sit for examination. I try to get them to collaborate in small group work. In a large group, I often play a bigger role. I try to get them to read the chapter before we meet. By doing so, I think students will be able to give their ideas and answers to me. I always welcome them to give me ideas in the beginning of the semester” [azizah/int/22.2.19].

Facilitating Learning

Fauziah explains that “to facilitate learning, I always ask them to read the section first before coming my class. If I don’t ask question, they will feel that don’t need to read anymore. They might think it is a waste of time reading the material before coming to the class. They get very dependent on me most of the time. They come to class expecting teachers to deliver the notes and summary for the chapters. I try to change students’ expectations. I want them to bring resource into the classroom and I will guide them through gradually depending on their abilities” [fauziah/int/19.4.19].

Angela states that “in the training we have been told to be facilitator as to guide students in their learning. They have been told to always focus on students. It is important for me to identify my students’ background and learning styles. With the knowledge about students’ learning styles, I should be able to facilitate each student. I am able to help students based on their own capability and provide remedial help whenever necessary” [angela/int/24.2.19].

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Nair indicates that the school has a lot of ICT facilities for students to use. He admits that *“students are busy reading examination reference books to prepare for the big tests. As a teacher, I try to help as much as I can. I always do group work and get students to talk to each other. In my class, I have identified some good students who would be helping weak students. I try to get them to gather in certain groups so that they don’t get the same students all the time. I want the good students to guide the passive students”* [nair/int/12.4.19]

Abu realises that his students need him to help them whenever they face problems in science. He states that *“students suppose to be taught to self-direct themselves. With the 3’s, the students should be guided to learn on their own and assess their knowledge from time to time. The teacher should not spoon-feed students. Many students expect teachers to come and bring notes for them. IT makes them lazy students. Therefore, we as teachers should provide guidance for learning whenever they can”* [abu/int/15.4.19].

Follow-Up Training

Since the teachers had undergone certain ICT training, we would think that teachers’ staff development would be sufficient. It was quite surprising when teachers felt that they still needed more training on smart schools. Angie says that *“I need more training. There was not enough exposure on smart teaching/approaches* [angela/int/24.2.19]. Moreover, Fauziah mentions that she needs *“more input regarding integration of ICT into teaching and learning”* [fauziah/int/19.4.19]. She realises that in order to be effective teacher, *“I needs input regarding ICT development and creativity in implementing teaching and learning. I think I need more preparation time to make my teaching interesting and effective. I feel that my knowledge needs to be upgraded. I think so!”* [fauziah/int/19.4.19].

Nair believes that *“as a teacher, I try to use whatever I have been taught during the training. I feel that the training is inadequate if there is no follow-up. I think it is crucial for teachers to be given clear examples regarding certain teaching techniques. I need to be trained in pedagogy of science. I don’t think I have enough skills, knowledge and ability if there is no follow-up training”* [nair/int/12.4.19].

Suzan thinks that the teachers function as secretaries in smart schools. She notices that 21st century skills require more unnecessary work for teachers who are already busy. She states that *“along lots of clerical work. Limited time, burdened with administrative tasks like clerical work, insensitive of top management in burdening teachers with other chores (even it is the task of the clerks). Regarding the training, I think I need to have more training on pedagogy. I don’t think it is enough exposure given during the training. Therefore, I feel I need more training”* [suzan/int/20.2.19].

Angela hopes that *“more courses for teaching and pedagogy are offered to teachers. I think we need to improve teaching. The administrative tasks should be given to clerks to handle them. I don’t think it is appropriate for teachers to handle both academic and administrative duties. I am willing to learn ways to improve my teaching than spending time learning and doing administrative duties”* [angela/int/24.2.19].

Azizah, who is one of the senior teachers feels that *“there are many things to learn as teachers. We have extra duties to handle now. I am sure that we all need training and re-training. I think the administrators should be focussing on providing more training for the teachers. It is about time for the schools to send more teachers for training. It is not fair for the same teachers to be sent for training. There should be some kind of monitoring to ensure that more teachers are sent for training”* [azizah/int/22.19].

CONCLUSION

This study reveals that ICT integration is still not prevalent in Malaysian schools despite a lot of money spent to train teachers to integrate ICT into subject teachers. As this study was intended to investigate the amount of IT that teachers used in their classrooms, the application of IT into classroom teaching is still poor. It was observed that teachers still are not confident enough to integrate IT into their subjects such as science. Despite training programmes in schools organized by the Ministry of Education (MOE), Malaysia teachers did not have the time to plan IT into their lessons. It is recommended that CPDT needs to be planned carefully so as to encourage teachers to provide opportunities for students to collaborate among peers in their classrooms. They need to be “guide by the side” which can persuade teachers to integrate IT that can motivate and enhance their learning. These teachers should be given the opportunities to attend specific workshops and training programmes that will equip themselves with

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appropriate attitude, knowledge and skills that can help them integrate IT into their classrooms. This is vital as IT can be used to increase productivity of teachers and learners/students. CPDT is vital to be designed and developed to enhance teachers' skills in making learning more enjoyable and fun.

To ensure the effectiveness of CPDT in IT skills and 21st century skills, teachers need to be trained not only to teach about computers but also to teach with computers. To increase the use and integration of ICT in the learning and teaching process, there must be changes in the roles of those involved in schools: administrators, teachers and students as well as communities. Students should be active learners, teachers as facilitators, principals as managers and communities as stakeholders in the context of today's schools (MOE, 1997). Whether or not technology is fully integrated into learning and teaching, teachers should facilitate learners by presenting information and providing feedback as often as possible in order to assess and improve student learning. Principals and headmasters as well as the policy makers must be sensitive in providing necessary infrastructure to help all schools in Malaysia. It the responsibility of all to ensure that schools provide equal opportunity and quality education for all learners regardless of different students' academic capabilities.

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