Benchmarking Your ICT Practices for Excellence in Schools

BY(i)TES 3.0

Create
Engage
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Educational Technology Division

BENCHMARKING YOUR ICT PRACTICES FOR EXCELLENCE IN SCHOOLS 3.0

Introduction

Benchmarking **Y**our **I**CT Practices for **E**xcellence in **S**chools **(BY(i)TES)** is a self-assessment tool that schools use to gauge the level of their ICT implementation as they work towards achieving excellence in using ICT for learning and teaching.

The first version of the tool, BY(i)TES 1.0, was rolled out to schools at the start of mp2 in 2003. The tool was designed for schools' self-assessment of their ICT implementation, which is similar to the approach adopted in the School Excellence Model (SEM) which schools are familiar with. It focused on six domains, namely, *'School ICT Leadership', 'Students' Use of ICT for Learning and Teaching', 'Teachers' Use of ICT for Learning and Teaching', 'Management of ICT Resources'* and *'Staff Development and Community Connections'.*

In 2006, in response to feedback from schools, refinements were made to BY(i)TES 1.0. BY(i)TES 2.0 focused on three domains, namely, *'School ICT Leadership', 'Pupil Involvement'* and *'Teacher Use'.* In 2008, BY(i)TES 2.0 was further refined as BY(i)TES 2.1, based on a calibration exercise conducted with 102 schools.

In Jan 2011, the tool was further revised to **BY(i)TES 3.0** to align with the mp3 vision of **Harnessing ICT, Transforming Learners** and the following mp3 goals:

- School leaders provide direction and create the conditions to harness ICT for learning and teaching;
- Students develop competencies for self-directed and collaborative learning through the effective use of ICT as well as become discerning and responsible ICT users;
- Teachers have the capacity to plan and deliver ICT-enriched learning experiences for students to become self-directed and collaborative learners, as well as nurture students to become discerning and responsible ICT users.
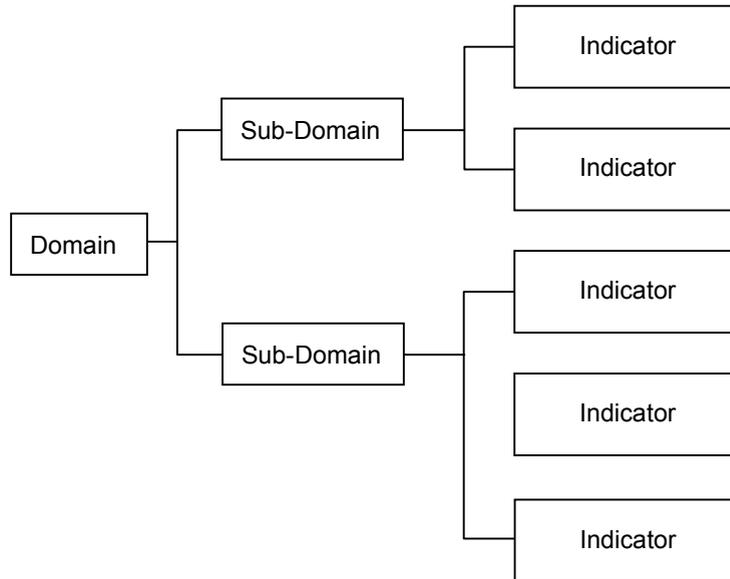
Domains, Sub-Domains and Indicators

BY(i)TES 3.0 comprises three domains:
1. School Leaders
2. Students
3. Teachers

The underlying assumptions are: school leadership is key to effective ICT implementation and the impact of ICT on pedagogical practices is evident through students' learning activities and teachers' design and delivery of ICT-enriched learning experiences.

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Each domain is divided into sub-domains and each sub-domain is defined by indicators. There are a total of four sub-domains and 14 indicators in the three domains.
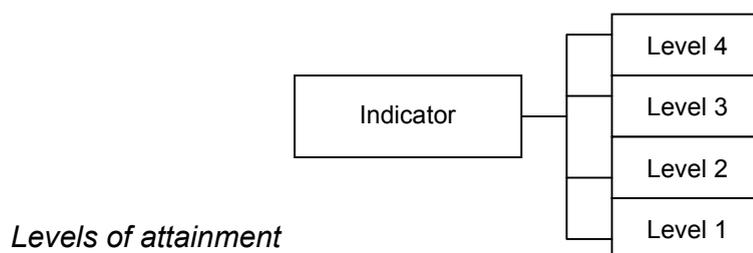
Relationship between domains, sub-domains and indicators

An example of Indicators in a Sub-Domain

Domain	Sub-Domain	Indicators
School Leaders	1.1 There is School ICT Leadership	1.1.1 Level of ownership and influence of school leaders
		1.1.2 Level of engagement of students, staff and partners
		1.1.3 Systems and processes for ICT implementation
		1.1.4 Focus of ICT professional development programme
		1.1.5 Focus of ICT implementation

Levels of Attainment

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                        ┌──────── Level 4
        ┌──────────┐    │
        │ Indicator │───┼──────── Level 3
        └──────────┘    │
                        ├──────── Level 2
                        │
                        └──────── Level 1
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Levels of attainment

Each indicator has four levels of attainment, levels 1, 2, 3 and 4. These four levels reflect the progress of a school's ICT implementation. For example:

Level of higher order thinking facilitated by ICT

1	2	3	4
recall of information →	understanding and application of information →	analysis and evaluation of information →	creation of new ideas, products or ways of viewing things

Focus of ICT implementation

1	2	3	4
driven mainly by technological considerations →	driven mainly by curriculum and pedagogical considerations →	informed by theories and research findings →	improved as a result of reflective practices

Assessment

Indicators in each sub-domain are assigned four levels based on the school's ICT practices. They are interpreted within the context of the specific domains and sub-domains. The level of attainment describes the school's prevalent ICT practices that are representative of at least 50% of the student and teacher populations.

Where the requirements of a level are only partially met, the lower preceding attainment level is assigned. In addition, the requirements of all the lower levels must be met before the next higher attainment can be assigned.

The overall BY(i)TES score is computed according to the following:

1. The score of the sub-domain is the average of the scores of its indicators.
2. The score of the domain is the average of the scores of its sub-domains.
3. The overall BY(i)TES score is the average of the scores of all three domains.

The overall BY(i)TES score indicates the level of the school's ICT implementation.

Achievement Band	Overall Score Range	Band Descriptors
Beginning	Score < 2.0	• Not meeting mp3 outcomes • Inconsistent implementation and integration of ICT-based practices and technologies
Intermediate	2.0 ≤ Score < 3.0	• Approaching mp3 outcomes • Consistent implementation and integration of ICT-based practices and technologies on a school-wide basis
Progressive	3.0 ≤ Score < 3.5	• Meeting mp3 outcomes • Sound integration of ICT-based practices and technologies with processes that enable scaling up of ICT integration to a higher level on a school-wide basis
Advanced	Score ≥ 3.5	• Exceeding mp3 outcomes • Sound and systemic implementation that sustains school-wide integration of ICT-based practices and technologies that are research-based

Domain 1 School Leaders

Sub-Domain 1.1	There is School ICT Leadership			
Indicator	**1**	**2**	**3**	**4**
1.1.1 Level of ownership and influence of school leaders	School leaders <u>articulate</u> the ICT vision and goals which are aligned with the MOE ICT masterplan.	School leaders take the <u>lead in developing and communicating</u> the <u>shared</u> ICT vision and goals to <u>gain buy-in</u> for ICT implementation to enhance students' learning.	School leaders lead in <u>harnessing</u> ICT to support <u>learner-centred and innovative classroom practices</u>.	School leaders lead in <u>developing an ICT culture</u> and <u>model</u> the effective use of ICT.
1.1.2 Level of engagement of students, staff and partners	School leaders engage <u>middle managers</u> in <u>developing, communicating, implementing and monitoring</u> the ICT plan.	School leaders engage middle managers and <u>teachers</u> in developing, communicating, implementing and <u>reviewing</u> the ICT plan.	School leaders engage middle managers, teachers and <u>partners</u> in <u>collective decision-making</u>, and in <u>assessment and review</u> of ICT implementation.	School leaders engage middle managers, teachers, <u>students</u> and partners to bring about <u>shared responsibility</u> to support the school in <u>realising the ICT vision</u>.
1.1.3 Systems and processes for ICT implementation	There are <u>loosely defined and limited</u> systems and processes that enable ICT implementation in the school.	There are <u>clearly defined</u> systems and processes that enable ICT implementation. <u>Monitoring and review processes</u> are in place.	There are <u>clearly defined</u> systems and processes for school-wide ICT implementation. Monitoring and review processes are in place for <u>continuous improvement</u> as well as to <u>inform future ICT planning</u>.	There are <u>detailed and clearly defined</u> systems and processes that enable ICT implementation in the school. These include using <u>research</u> and review findings to <u>account for</u> the <u>impact on student learning</u> and <u>improvement of</u> ICT implementation.
1.1.4 Focus of ICT professional development (PD) programme	The PD programme focuses on <u>equipping</u> teachers with <u>ICT skills</u> to deliver ICT-based lessons.	The PD programme focuses on <u>building</u> the <u>capacity</u> of teachers on the <u>pedagogical use</u> of ICT to deliver ICT-based lessons.	The PD programme adopts a <u>customised and differentiated approach</u> to build teachers' capacity to deliver <u>ICT-enriched learning experiences</u> that are learner-centred. <u>Monitoring and evaluation processes</u> are in place to ensure that the <u>PD programme</u> achieves desired outcomes.	The PD programme adopts a customised and differentiated approach, and <u>fosters a collaborative culture</u>. This <u>enables</u> teachers to engage in <u>collective inquiry</u> to design ICT-enriched learning experiences.
1.1.5 Focus of ICT implementation	ICT implementation is driven mainly by <u>technological considerations</u>.	ICT implementation is driven mainly by <u>curriculum and pedagogical considerations</u>.	ICT implementation is driven mainly by curriculum and pedagogical considerations as well as <u>informed by theories and research findings</u>.	ICT implementation is driven mainly by curriculum and pedagogical considerations and improved <u>through reflective practices</u>.

Domain 2 Students

Sub-Domain 2.1	Students Use ICT for Learning			
Indicator	**1**	**2**	**3**	**4**
2.1.1 Level of higher order thinking facilitated by ICT	Students are involved in learning activities that facilitate the recall of information.	Students are involved in learning activities that facilitate understanding and application of information to arrive at a conclusion.	Students are involved in learning activities that facilitate analysis and evaluation of information resulting in the deepening of understanding and knowledge.	Students are involved in learning activities that facilitate creation of new ideas, products or ways of viewing things.
2.1.2 Level of self-directed learning (SDL) facilitated by ICT	Students set learning goals according to instructions given by the teacher. They work on teacher-directed learning activities that develop them to think independently to achieve their learning goals.	Students set learning goals and identify learning tasks to achieve the goals with guidance from the teacher. They work on teacher-facilitated learning activities and look for resources to complement given resources to achieve their learning goals.	Students work on learning activities that allow them to negotiate and set their learning goals and plans as well as manage and monitor their own learning. They look for resources and incorporate feedback and input from their peers to achieve their learning goals.	Students work on learning activities that allow them to independently set learning goals and plans as well as extend their learning. They reflect on their own learning and evaluate their own progress to improve their learning.
2.1.3 Level of collaborative learning (CoL) facilitated by ICT	Groups set group goals and tasks according to the instructions given by teachers. Students are closely guided and monitored by teachers and focus mainly on fulfilling individual responsibilities to complete given tasks.	Groups set group goals, tasks and determine group processes with guidance from teachers. Students are accountable for the completion of individual assigned tasks as well as helping group members achieve group goals.	Groups set group goals, tasks and determine group processes as well as monitor the groups' progress with guidance from teachers. Students contribute ideas and consider the viewpoints of others to construct knowledge that is crucial to their learning.	Groups independently set group goals and tasks, determine group processes and monitor the groups' progress. Students inquire collaboratively, teach one another reciprocally and create new ideas, products or ways of viewing things.
2.1.4 Use of ICT tools to support learning	Students use ICT tools that require them to apply basic ICT skills[1] to support their learning.	Students select and use appropriate ICT tools to support their learning as guided by teachers.	Students maximise the use of ICT tools to enhance their learning as guided by teachers.	Students transfer current knowledge of the use of ICT tools to the learning of new technologies to enhance their learning.
2.1.5 Extent of student involvement in curriculum[2], and SDL and CoL activities facilitated by ICT	Students are involved in ICT-enriched learning activities for 30% or less of the curriculum. These ICT-enriched learning activities facilitate self-directed learning and collaborative learning for 10% or less of the curriculum.	Students are involved in ICT-enriched learning activities between 30% and 50% of the curriculum. These ICT-enriched learning activities facilitate self-directed learning and collaborative learning between 10% and 20% of the curriculum.	Students are involved in ICT-enriched learning activities for 50% to 60% of the curriculum. These ICT-enriched learning activities facilitate self-directed learning and collaborative learning for 20% to 25% of the curriculum.	Students are involved in ICT-enriched learning activities for more than 60% of the curriculum. These ICT-enriched learning activities facilitate self-directed learning and collaborative learning for more than 25% of the curriculum.

Sub-Domain 2.2	Students are Discerning and Responsible ICT Users			
Indicator	**1**	**2**	**3**	**4**
2.2.1 Demonstration of cyber wellness practices	Students are aware of the cyber wellness issues. They know the social, emotional and ethical impact on the use of ICT.	Students are able to recognise and understand the social, emotional and ethical impact on the use of ICT. They adopt safe and responsible ICT practices through given sets of guidelines.	Students are able to evaluate the social, emotional and ethical impact of using ICT and take proactive steps to protect themselves and others.	Students positively influence their peers on safe and responsible use of ICT. They contribute actively by promoting cyber wellness to the student community.

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[1] Refer to Baseline ICT Standards for the types of basic ICT tools and skills.
[2] Curriculum refers to Academic Curriculum which includes Languages, Mathematics, Sciences, Humanities, PE, Art and Music.

Domain 3 Teachers

Sub-Domain 3.1	Teachers Create ICT-enriched Learning Experiences			
Indicator	**1**	**2**	**3**	**4**
3.1.1 Design of ICT-enriched learning experiences	Teachers adopt ICT tools to support existing classroom practices.	Teachers adapt ICT tools for their lessons. They integrate technology to improve existing classroom practices.	Teachers design ICT-enriched learning experiences and harness technology for engaged learning.	Teachers transform learning experiences by embracing and using technology innovatively.
3.1.2 Design of ICT-enriched learning experiences for SDL and CoL	Teachers provide specific instructions, learning activities and resources as well as close monitoring of students' learning process in setting and achieving learning goals and group goals.	Teachers scaffold students' learning in setting learning goals and facilitate groups to complete individual assigned tasks as well as achieve group goals.	Teachers design learning activities that teach students to set learning goals and manage and monitor their own learning, as well as to construct knowledge collaboratively.	Teachers design learning activities that allow students to independently set learning goals, and manage and monitor their own progress as well as extend their learning. They also teach students to inquire collaboratively to create new ideas, products or ways of viewing things.
3.1.3 Teacher collaboration facilitated by ICT	Teachers share and exchange ICT-enriched learning and teaching resources.	Teachers improve classroom practices by collaboratively designing ICT-enriched learning experiences for students.	Teachers collectively inquire to reflect on their classroom practices to create ICT-enriched learning experiences that are learner-centred.	Teachers collectively inquire to continuously reflect, improve and innovate on their classroom practices.

Glossary

Term	Description	Indicator
shared ICT vision	A shared ICT vision is one to which every staff can see a personal role in achieving the vision. It inspires every staff in a school to work collaboratively towards common goals related to ICT for learning and teaching.	1.1.1
innovative	Refers to creating new possibilities of using ICT for learning and teaching through adaptation, improvisation or invention for the purpose of improvement.	1.1.1 2.1.4 3.1.1 3.1.3
ICT culture	There is strong presence of the use of ICT in the school resulting from shared experiences, social norms, unwritten rules, ethics and social interaction among school leaders, staff and students in the belief that ICT supports effective learning.	1.1.1 1.1.4
model effective use of ICT	School leaders invest time, efforts and resources to encourage the use of ICT in learning and teaching. They are: - constantly looking out for ways to use ICT to support engaged learning; - sharing new ideas with staff; - providing incentives to motivate staff to try new ideas for learning and teaching; and - harnessing ICT for their own professional duties and development.	1.1.1
collective decision-making	Collective decision-making draws out collective wisdom of the group and encourages each group member to be actively involved in the process. Members participate by sharing information, ideas and perceptions concerning the decision. Collective decision making: - encourages free exchange of conflicting views, hence members may agree to disagree; - expresses real opinions; - explores the unfamiliar; and - provides innovative solution.	1.1.2
shared responsibility	Refers to the commitment and support that goes beyond the individuals who act cooperatively in the context of common goals. Shared responsibility helps all partners develop a sense of ownership as individuals see themselves as part	1.1.2

Term	Description	Indicator
	of a larger system where all work together towards a common goal.	
ICT-enriched learning experiences	ICT-enriched learning experiences happen when technology: • brings meaning and vibrancy to classroom activities; • provides students with real-life scenarios and connections among subject areas to enhance learning; • engages students in authentic learning; • provides students with opportunities to experiment and apply higher order thinking; • provides students with experiences to explore beyond the classroom; or • enables students to reach out to the world through global communications and exchange of ideas and experiences.	1.1.4 3.1.1 3.1.3
collective inquiry	Collective inquiry is the process of building shared knowledge by asking and answering significant questions together. It is a collective endeavor in which teachers examine evidence of effective practices to improve their practices.	1.1.4
technological considerations	Refers to infrastructure and inventory management that form the basis for decision making on ICT implementation.	1.1.5
pedagogical considerations	Refers to decision making on ICT implementation based on sound instructional design and appropriate use of ICT tools to bring about transformation in learning and teaching which includes delivering student-centred learning, meeting students' learning needs, achieving learning outcomes and developing 21st century competencies.	1.1.5
reflective practices	Reflective practices are guided by research and learning theories and may include action research, narrative inquiry and lesson studies to enhance teachers' understanding in lesson design and delivery in an iterative process for improvement.	1.1.5
understanding of information	Refers to the ability to explain, paraphrase and apply information as well as represent information in different ways.	2.1.1
application of information	Refers to the ability to use knowledge in a different context. This requires a higher level of understanding and may include the application of	2.1.1

Term	Description	Indicator
	rules, methods, concepts, principles, laws and theories.	
analysis of information	Refers to the ability to break down a concept into its component parts, determine how the parts relate or interrelate to one another or to an overall structure or purpose.	2.1.1
evaluation of information	Refers to the ability to make judgements and justifications based on the criteria and standards through checking and critiquing one another's work.	2.1.1
deepening of knowledge	Occurs when the learning process involves a discussion or investigation of a topic by breaking down a topic into key ideas and understanding how these ideas are connected, discovering new meanings and applying them in different situations.	2.1.1
learning goals	Learning goals reflect one's desire to learn new skills and understanding for improving one's competence. Students focus on steps that they will take in achieving the goals in terms of knowledge and/or skills acquisition.	2.1.2 3.1.2
teacher-directed	Teachers play the major role in deciding what is to be learnt, why it is to be learnt, how it is to be learnt, when it is to be learnt and where it is to be learnt.	2.1.2
teacher-facilitated	Teachers support and encourage as well as provide resources to enable students to take more control of the learning process.	2.1.2
group processes	Refers to how the group works together to achieve a goal or objective by assigning individuals roles and responsibilities and establishing common understanding of the group's purpose resulting in cohesion and interdependence among group members.	2.1.3
construct knowledge	Students construct knowledge by incorporating new understanding into prior learning to develop new ways of looking at things, making choices on new ideas to accept and fitting them into their current established view of the world to bring about an alteration in their perception thus reframing their thinking.	2.1.3 3.1.2

References

1. Apple Computer, Inc. (1995) Changing the Conversation about Teaching and Learning – A report on 10 years of ACOT Research.

2. Churches, A. (2008) Bloom's Revised Digital Taxonomy. From http://www.techlearning.com/techlearning/archives/2008/04/AndrewChurches.pdf

3. Curriculum Planning and Development Division, Ministry of Education, Singapore (2007). The PETALS™ Primer.

4. Educational Technology Division, Ministry of Education, Singapore (2007). Cyber Wellness Framework. From http://ict.edumall.sg/cyberwellness/about.html

5. Educational Technology Division, Ministry of Education, Singapore (2009). Baseline ICT Standards: Guide to implementation. From http://ict.edumall.sg/baseline/baseline.html

6. Education Programmes Division, Ministry of Education, Singapore. Social and Emotional Framework. From http://www.moe.gov.sg/education/programmes/social-emotional-learning/

7. Gibbons, Maurice (2002). The Self-Directed Learning Handbook: Challenging Adolescent Students to Excel. San Francisco, CA: Jossey-Bass.

8. ISTE, 1.800.336.5191 (U.S. & Canada). (2007). The ISTE NETS and Performance Indicators for Students (NETS•S). From http://www.iste.org/standards/nets-for-students.aspx

9. Ministry of Education, Singapore (2010). Nurturing Our Young for the Future: *Competencies for the 21st Century*. From http://www.moe.gov.sg/committee-of-supply-debate/files/nurturing-our-young.pdf

10. Mishra, P & Koehler, Matthew J. Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. From http://punya.educ.msu.edu/publications/journal_articles/mishra-koehler-tcr2006.pdf

11. Roger T, David W. Johnson (1988). Cooperative Learning: Two heads learn better than one. Winter 1988 From http://www.context.org/ICLIB/IC18/Johnson.htm

12. Scardamalia, M. (2002). Collective Cognitive Responsibility for the Advancement of Knowledge. In: B. Smith (ed.), Liberal Education in a Knowledge Society. Chicago: Open Court, pp. 67–98.

13. Schools Division, Ministry of Education (2011). Leadership in Curriculum and Instruction (LCI) Development Framework.

14. School Appraisal Branch, School Division, Ministry of Education, Singapore (2000). The School Excellence Model - A Guide, First Edition.

15. Training & Development Division, Ministry of Education, Singapore (2010). Schools as Professional Learning Communities Second Edition.

16. UKCLE (2000) Personal Development Planning: What is reflective practice? From http://www.ukcle.ac.uk/resources/personal-development-planning/what/