

**RE-DESIGNING LOWER SECONDARY
DESIGN & TECHNOLOGY CURRICULUM AND ASSESSMENT
... A MODULAR APPROACH @ BEATTY**

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Preamble

At the MOE Work Plan Seminar 2004, Mr Tharman Shanmugaratnam, Minister for Education, clearly pointed out that “too much learning today is aimed at recalling facts and model answers for examinations”, and that too many Singaporeans “study for the sake of examinations and forget everything when the examinations were over”. They also have little time and interest in reading beyond the examinable syllabus.

In year 2005, to address the myopic focus of teaching and learning for assessment, and to align with the Ministry of Education’s call for a “Teach Less, Learn More” (TLLM) approach, the D&T department of Beatty Secondary School took on the first step in re-designing its lower secondary D&T curriculum and alternative mode of assessment to take teaching and learning of D&T to greater heights.

In this paper, Beatty Secondary School will share her experience on how the lower secondary D&T curriculum and mode of assessment were re-designed to nurture pupils to develop inquiring minds through different learning styles, take ownership of their learning to become passionate lifelong learners, and be equipped with the relevant competencies to meet the future needs of industries.

It will first explore the challenges educators face amidst the rapid changing landscape of D&T education in Singapore which has moved from “craft-based” to design/problem-based”. Next it outlines some of the governing principles/philosophy behind the need to re-design the curriculum and modes of assessment. It then goes on to outline some of the practices rolled out at Beatty and their impact on teaching and learning so far. Finally, it concludes by reflecting on the constraints/problems which arose during implementation and some steps taken to rectify them and the journey ahead...

CHALLENGES FACED BY EDUCATORS

The landscape of the Design and Technology (D&T) curriculum has evolved tremendously over the past two decades moving from “craft-based” to that of the current “design/problem-based” programmes and approaches. The current shift in paradigm of D&T education has also inevitably brought about some tension and caveats faced by educators such as the following :

▪ CONTENT

“Too much to teach within too little time” is a common dilemma that many teachers face. Given a tight curriculum, it is a challenge for teachers to effectively plan the scheme of work within the allocated time frame and apply the right strategies to achieve the desired learning outcomes. There has been too much focus on *how much* students learn instead of *how well* they learn. Teachers have the tendency to teach to the test. This invariably leads to an over-emphasis on assessment and grades and consequently, students’ myopic focus on learning.

▪ DELIVERY

Teaching - the mere delivery of a prescribed curriculum is no longer sufficient to address the learning needs of pupils. It is essential for teachers to strike a balance between retaining the rigour of the core curriculum for the development of skills and knowledge in pupils, and providing a more pupil-centred curriculum to harness self-directed learning and creativity of pupils to make learning of D&T more authentic and meaningful.

▪ ASSESSMENT & PERFORMANCE INDICATORS

Testing, an integral part of the teaching-learning process, has always been an instrument to measure the effectiveness of teaching and learning. With the change in pedagogical approach, there is also a need to shift the emphasis of “assessment to test learning” to “assessment to engage learning”. Assessment should not be just an indicator to evaluate teacher / student capability, but more importantly as a feedback of how well teaching and learning has taken place.

UNDERLYING PRINCIPLES / PHILOSOPHY

In re-designing the curriculum, two underlying principles governed our approach.

Firstly, every child possesses some talents or abilities. Every pupil should be given opportunities to excel in his/her own talent spheres. The curriculum and mode of assessment are re-designed on the basis that they should harness and leverage on the diverse, creative talents and abilities through the different learning preferences and styles of each individual. Based on this principle, the Beatty D&T team conscientiously embarked on designing a more varied curriculum with differentiated teaching and learning strategies and modes of assessment. This is similar to Howard Gardner's (1983) theory of multiple intelligences. Gardner believes that most of us can develop each intelligence through environmental enrichment. Second, for most of us, our abilities across the eight intelligences lie on a continuum, i.e., each individual may possess strengths in two or three of the intelligences, but not have a particular strength in any of the other areas. Third, there are multiple ways to demonstrate proficiency in one intelligence. However, Gardner cautions that the intelligences, although relatively independent entities on paper, work together in complex ways in everyday life. In general, Gardner defines intelligence as the human ability to solve problems or to make something that is valued in one or more cultures. These intelligences are reflective of the diversity of skills found in our modern, technological society.

To develop the potential of every pupil in Beatty, the following table underscores the D&T team's effort in engaging the students in various activities to ignite and excite their passion in learning.

Domain	Modular activities
Linguistic	Writing presentation and script of drama
Logical-mathematical	Calculation in applied science eg. Electronics
Spatial	Sketching shapes and forms of objects
Bodily - kinesthetic	Project realization and dramatization of Design Process
Inter- and intrapersonal	Works in team on projects, Peer critique and self-evaluation
Naturalist	<ul style="list-style-type: none">• Many Ways of Seeing (MWOS) appreciation• Taking pictures of nature in research work for shapes and forms

Secondly, the team believes that students learn better through a ‘constructivist’ approach. There is a famous Chinese proverb: “*I hear and I forget, I see and I remember.*” However, simply “remembering” is not sufficient. It is more important to engage pupils in activities to make them learn, as the team believes in “*I do and I learn.*”

Therefore, by focusing only on desired knowledge goals and not consider individual student learning styles, there is a risk of developing “meaningless” knowledge and skills that are irrelevant to the pupils and hence easily forgotten.

PROCESS

The team adopted a three-pronged strategy in re-designing the curriculum and assessment using a modular approach.

A) STREAMLINING THE CURRICULUM

- *Content Reduction*

The Secondary 1 and 2 curriculum were reviewed and it was found that there was some overlap in the introduction of the topics in Sec 1 and Sec 2 syllabi. The content for both syllabi was divided into modules and “reduced” considerably. This was done through integration of content domains in the Art and D&T syllabuses. The 13 topics for each of the Sec 1 and Sec 2 syllabuses were consolidated to 5 - 6 modules for each level and each module is delivered as an independent unit. “Less is more” is an underlying principle that many graphic designers adopt. The content reduction adopts this principle to create “white space” that makes teaching and learning more “breathable”, allowing teaching and learning to take place beyond classroom walls. Only then can teachers and pupils have time and space to reflect and internalize, to “think deep” and “think wide”.

- *Structured Time Frame*

It has been a common practice that the class size of D&T lessons is kept at half the normal class size of about 20 pupils for better teacher-pupil interactive teaching and

learning. Half the class will attend D&T lessons while the other half will attend Home Economics. Each pupil gets to attend D&T lessons for a semester each year. Thus, the time frame for the whole course of D&T is only one semester. Very often, lessons are disrupted by school events and public holidays. To work within a more realistic time frame, the modules are structured into a 15-week curriculum time frame for each semester. Why 15 weeks? This is based on the school calendar of events, factoring in eg, Sec 1 orientation week, common test week, long holidays (such as Chinese New Year, National day), revision and examination period, etc. This reflects a more realistic time frame for the completion of the course. Teaching and learning can thus take place at a more manageable pace and lessons can then become more interactive as teachers need not rush to meet the tight deadline of completing the syllabus within the “reduced” time. This allows more time for teachers to reflect on their teaching and pupils, on their learning.

B) A MORE PUPIL–CENTRED APPROACH PEDAGOGY

The curriculum has been designed to adopt a more pupil-centred than a teacher-centred approach with reference to the following considerations where pupils take ownership to achieve their learning goals.

More...	Less...
Engaged Learning	Drill and Practice
Differentiated Teaching	‘One-size-fits-all’ Instruction
Guiding, Facilitating, Modelling	Telling
Formative and Qualitative Assessing	Summative and Quantitative Testing
Spirit of innovation and enterprise	Set Formulae, Standard Answers

(Reference : <http://www.moe.gov.sg/bluesky/tllm.htm>)

Less emphasis is placed on drill and practice and rote learning. Varied and goal-directed group activities are carried out to engage pupils actively. These group activities create interdependence and interaction amongst students, enabling them to learn through collaboration. There is less formal classroom setting, creating less stress but making learning a fun activity. This stimulates interest inspiring them to innovate original ideas to projects briefs. The teacher’s role shifts from a “content deliverer” to

that of a facilitator for learning. The teacher guides and monitors rather than tells and instructs. Differentiated teaching strategies are also planned for varied ability groups. There is more “hand holding” for the less-academically challenged students. Alternative modes of assessment (coursework-based) have replaced traditional pen and paper assessment to help the pupils learn and relate to problems associated to the real world.

C) ADOPTING ALTERNATE MODES OF ASSESSMENT

Along with the changes in the curriculum and in an effort to re-design the modes of assessment, the line between learning and assessment is deliberately “blurred”. Assessment should be part and parcel of teaching and learning, and not as an intimidating tool to inject fear and anxiety and stifle learning. Over-emphasis on traditional pen and paper assessment tends to lead to over-emphasis on performance in terms of scores and grades, which does not reflect students’ progress explicitly. A grade for a test, conducted usually at the end of a unit or end of term becomes an outcome measure that indicates pupils’ achievement empirically, but does not reflect the extent of pupils’ learning and how it can be improved. Consequently it is too late to invoke intervention measures to help pupils improve.

Assessment, in Beatty Secondary School’s D&T curriculum, aims to

- a) engage pupils in activities based on more authentic contexts, so that they are more focused on learning, rather than just achieving grades.
- b) provide meaningful feedback on how pupils can improve. The assessment rubrics are transparent and students are clear about how they are assessed. This provides clear goals for pupils to produce quality work. Pupils are able to self-assess and improve their work before handing in their work to the teacher. Peer observation is encouraged and carried out.
- c) provide feedback on how pupils think, how they respond to the instructional strategies and serve as an incentive to motivate student learning and teacher effectiveness. Assessments in the form of oral presentation, journal writing, observations etc., allow teachers to analyse and understand pupils’ learning and attitude towards the teaching and learning strategies. This fosters positive encouragement and motivation for further progress and improvement.

d) encourage pupils to excel in their areas of strengths and improve on their areas of weaknesses through the different forms of assessment. Assessment shall no longer be seen as a discriminating process to distinguish the good from the bad. Rather, it is to leverage on pupils' enthusiasm and commitment towards learning, making them independent, passionate, life-long learners.

- *Modes of Assessment*

Traditional examination and formal written tests are replaced by a variety of authentic assessments “tagged” to every module to provide pupils with opportunities to demonstrate a range of competencies while allowing teachers to observe and evaluate pupils' learning process and outcomes. More importantly, they seek to enable pupils to understand and learn from conceptual errors. These forms of assessment require pupils to be active participants in the teaching and learning process, and are more likely to invoke higher-level thinking skills and problem-solving skills.

Portfolio

This is a documentation of pupils' learning process. Pupils are required to document all preparatory work and related information gathered that lead to the completion of the actual task for assessment. The “portfolio process” allows teachers to assess pupils' involvement and what they have learned.

Example :

- *Module 2 – Communicating Through Design: Shape & Form Exploratory Technique (Secondary 2)*

For this assessment, pupils are:

- taught basic sketching techniques and subsequently, given time to practise sketching on their own,
- required to research for design ideas based on a given theme,
- to conceptualise, from the research ideas, their design for the theme and practise as much as they can
- to present the sketch of the actual design (in real time within a period of, say, 30 minutes) on a designated day stipulated by the teacher.

Assessment criteria include:

- ❖ practice work
- ❖ research materials
- ❖ the sketching of the actual design.

Performance Assessment

This form of assessment requires pupils to translate planning and preparation into classroom performance.

Example :

- *Module 1 – Design Approaches: The Dramatisation Approach (D.A.P.) (Secondary 2)*

(Refer to Appendix 2)

For this assessment, pupils are required to write a script for a skit and dramatise it to help their peers to have a better understanding and appreciation of the stages of the design process.

Assessment criteria comprises content of script, individual acting skills and teamwork.

Presentation

This form of assessment requires pupils to give an oral presentation to illustrate the results of a project. Presentations are usually enhanced with visual aids such as powerpoint slides, charts, mindmaps, etc.,.

Examples :

- *Module 1 – Introduction to D&T: Product Analysis (Secondary 1)*

Pupils are required to “show & tell” about a product, in terms of design features, function, materials, etc.

- *Module 2 – Materials: Materials and Their Uses (Secondary 1)*

Pupils are required to present their findings on the use of different materials (wood, plastics, metal) for different products.

Assessment for the above tasks consists of oral presentation skills and contents of research.

Practical Work - Skills and Processes

This is mainly set for psychomotor skills and knowledge of practical processes to complete an artifact. The hands-on skills assessment provides a mainstay of the less academically inclined pupils.

Examples:

➤ *Module 5 – Tools and Processes (Secondary 1)*

➤ *Module 4 – Planning and Production (Secondary 2)*

Pupils are to “realize” their design ideas into an artefact through the use of workshop tools and given materials.

➤ *Module 6 – Technology (Secondary 1)*

Pupils are required to perform practical circuit connections and understand its application through the use of basic tools and components.

Assessment criteria include observation of workshop safety rules, appropriate use of tools and machinery and quality of work.

Group work

This is to encourage pupils to cooperate and collaborate to complete a project. This fosters sharing of knowledge, partnerships, communication, responsibility, etc.

Examples:

➤ *Module 1 – Introduction to D&T: Product Analysis (Secondary 1)*

➤ *Module 3 – Materials: Materials and Their Uses (Secondary 1)*

➤ *Module 4 (Assignment 1) – The Design Process (Secondary 1)*

➤ *Module 1 – Design Approaches: The Dramatisation Approach (D.A.P.) and Many Ways of Seeing (Secondary 2)*

➤ *Module 4 – Planning and Production (Secondary 2)*

Assessment criteria comprise quality of end product, which usually reflect the degree of “collaboration” within the group as a whole.

Self-discovery

Pupils make sense of their prior knowledge via actively engage in sensory experiences, through observations in real-life contexts. This is aided by working with their peers through group discussion and interaction,

Example:

- *Module 1 – Design Approaches: Many Ways of Seeing (MWOS) (Secondary 2)*
Pupils are first introduced the fundamentals of visual design - “Lines, Shapes, Forms and Colours” and apply their photography skills to capture pictures that are relevant to these topics. Using the pictures taken, produce a photo-montage (collection of pictures of related theme) as evidence of their understanding of knowledge and interpretation of the topics.

Assessment criteria include the relevance and aesthetic aspects of the work done.

Research

Pupils are introduced to the “how” in conducting research and are required to apply these research skills to gather and synthesize relevant information for given topics.

Example:

- *Module 4 –The Design Process(Assignment 4) (Secondary 1)*
Pupils are to conduct research to gather relevant information and ideas for this task. They are also required to document their research materials for assessment.

Assessment criteria include the extent of research done, effort and relevance.

Written Tests

“Open-book” written test of completed topics is also administered to elicit pupils’ responses and understanding. Questions are “open-ended” and will not lead to pre-set answers that simply require recalling of facts.

Example:

- *Module 3 –Materials: Materials and Their Uses (Secondary 1)*

Self and Peer Assessment (Critique)

This is to provide opportunities for students to develop the skills to assess themselves and their peers.

At the end of each module, pupils are to evaluate their own learning for individual assignment, group evaluation for group work and peer evaluation against other groups.

Examples:

- *Module 5 – Evaluation: Peer Critique (Secondary 2)*
Pupils are guided to carry out peer evaluation objectively for their own learning as well as for their peers’ improvement in the work.

In addition to the various modes of assessment, pupils are also assessed on effective communication through the modules in the following ways:

- ✓ Sketching and reinforcing ideas with explanatory notes
- ✓ Oral presentation
- ✓ Questioning and managing questions
- ✓ Written responses in tests

Character development is also emphasized. Through teacher observation throughout the course, the pupils are assessed on their attitude. This includes punctuality (reporting to class, meeting deadline), level of participation in class, commitment, etc.,. (Refer to Appendix 5)

REFLECTIONS

▪ *Outcomes*

The modular approach curriculum and modes of assessment have produced significant teaching and learning benefits.

➤ Learning :

Pupils learn beyond textbooks and classroom through conducting research and processing information from various sources. Pupils become less dependent on “teacher and textbook” from this self-directed learning experience. The transparency of assessment rubrics make pupils clear about their learning goals and achievement targets. Consequently, pupils indirectly take greater ownership of their learning and success.

Group work requires pupils to communicate their ideas and integrate different ideas among mixed ability teammates in order to get an assignment done. This cooperative learning towards a common goal fosters their social interaction skills and provides real-life context learning. The oral presentations have helped the pupils to gradually overcome their fear in speaking to an audience and gain greater confidence in their public speaking skills. The pupils have become more ready to present compared to the beginning when they shun such exposure and required much encouragement.

The “showcase” of pupils learning through oral presentations and display of completed work enables pupils to self-evaluate their learning against their peers, promoting peer learning which motivates them to sharpen their competitive edge to excel.

The modular curriculum and forms of assessment break the monotony of traditional “chalk and talk” teaching and “pen and paper” assessment. Pupils find lessons more fun-filled and engaging as there is more mobility and interaction in class. Lessons are filled with “variety” as they are required to apply different skills to fulfill assessment criteria of each module.

The withdrawal of written examination makes learning less stressful and there is an obvious shift in pupils’ focus. Questions like “*Teacher, will this be tested?*”, “*How many marks will we get?*”, “*What is the percentage of this for CA (Continual assessment), SA (Semestral Assessment)?*” are since less heard. Pupils are more focused on tasks and become less “obsessed” in simply achieving grades.

The less academically inclined pupils feel less “stressful and intimidated” in D&T lessons as they are aware that though not being able to excel in all aspects, there are some areas that they can be better than their peers. This builds their confidence and keeps them continue to learn at productive levels.

The shift of emphasis from teacher-centred to activity-centred lessons has provided opportunities for meaningful teacher-pupil interaction. The less formal classroom setting allows teachers to monitor and observe pupils’ learning behavior and provide timely feedback for improvement. Feedback thus becomes instantaneous and spontaneous as pupils are able to clarify their doubts immediately.

➤ Teaching

The modular approach curriculum has allowed greater flexibility and creativity in the teaching strategies. Teachers are able to incorporate and try out new ideas in our strategies to make the activities purposeful and relevant. This makes teaching more satisfying.

Before the implementation of the re-designed curriculum, they had to “rush” to complete the syllabus in order to meet examination deadlines. The reduction of content frees up time for us to plan and reflect on our teaching strategies, enabling us to teach at a manageable pace to address pupils’ learning needs. The modules being taught as

independent units provide us the freedom of choice to decide which module to be done at anytime of the term to optimise the use of resources.

Through the various activities and modes of assessment, as well as through the evidence of work done by pupils, teachers are able to gather useful feedback on the instructional strategies. From the feedback, they are able to improve on the effectiveness of the curriculum.

Teachers derive a greater sense of satisfaction and pride from the positive learning outcomes achieved by pupils, especially when treated with surprises of quality work that exceeds our expectation. Among fellow colleagues, they are ever-ready and eager to share among each other good work produced by pupils. This helps to review the assessment criteria to gauge the potential of pupils.

- *Contributing Factors to the Success*

The strong “top-down (leadership) support” for the bottom-up (D&T staff) initiatives largely contributes to the success of the new curriculum approach. With a generous budget to support the hardware and software needs, the department is able to implement most, if not all, of the initiatives. This witnessed the setting up of facilities such as Technology Studio, Electronics Lab, Learning Gallery and Art and Design Gallery, ICT (Information & Communication Technology) Room. The 5 tablet PCs and 12 computers in the ICT rooms provide strong support to serve students’ IT needs.

The strong “camaraderie” of the D&T staff is another trade mark for the success. Teachers and technical support staff work cohesively and are “selfless” in the implementation of the curriculum. They always engage in the sharing of ideas on a regular basis to evaluate and refine the modules. They are always willing to experiment ideas proposed by any members of the staff.

Another key factor for success is the pupils, who are the main stakeholders for the programme. With the “no-examination” stress, pupils come to lessons in a lighter mood. This eases the classroom tension and arouses willingness to play a more active role in the programme. Pupils are more engaged and responsive to the instructional strategies and this fosters a healthier teacher-pupil relationship in the classroom. For example, the pupils had enjoyed the assignment on Design Process using the “*Dramatisation*

Approach (D.A.P.) (Refer to Appendix 2). On the day of presentation, there were lots of fun and laughter amidst learning. Students' effort was evident from the "extra miles" that they took to see to the success and to outshine their peers. They were well-rehearsed and well-equipped for the presentation.

- *Obstacles/Difficulties at Implementation Stage*

Teachers have difficulty initially adapting to the shift in paradigm. Afraid that they are not on the common goal of the "*Teach Less, Learn More*" initiative, they had apprehension of "how much is too much" because "over-teaching" had seldom been a concern as long as they teach according to prescribed scheme of work. They met regularly on informal basis to allay the fears and ensure that everyone works towards the common objective. Being new to the assessment modes, teachers tend to interpret the rubrics differently. To ensure consistency, moderation is carried out among the teacher assessors. With the change of role from a teacher who delivers content to that of a facilitator for learning, they have to sharpen the facilitation skills to encourage active participation from the pupils.

In the planning and initial implementation stage, pupils varying ability in the Express and Normal (Academic) streams were overlooked. A common programme was designed for both streams. However, teachers realized that the normal (academic) stream pupils needed more time to respond to the instructions. Much "hand-holding" was needed. To address this problem, they simplified and structured the instructions to cater to their needs. For example, for the module on "The Design Process", the writing of the situation, design brief and specifications were much guided and structured.

A common problem among pupils in group activities is unbalanced participation and contribution. Thus, to address this issue, the component "Group Evaluation" is incorporated in every group activity to serve as a feedback for the teachers to intervene and take remedial action. Also, teachers assume the role of observers during activities to provide immediate feedback and advice to the pupils concerned to play a more active role.

CONCLUSION

The re-designed curriculum has brought positive outcomes of teaching and learning, resulting in optimizing the 'white space' created in our curriculum. Lessons are more enjoyable and fun-filled yet enriching, as reflected in the feedback by staff and pupils. The D&T department will continue to explore various means to bring meaning and life to out-of-classroom lessons to engage pupils to maximise their learning. This milestone marks a new beginning of yet another teaching and learning journey to nurturing independent, life-long learners in Beatty...

APPENDICES

[Appendix 1 – Example of Syllabus Outline](#)

[Appendix 2 – Brief on the Dramatisation Approach \(D.A.P\)](#)

[Appendix 3 – Example of Assessment Rubric \(D.A.P\)](#)

[Appendix 4 – Example of Evaluation Form \(D.A.P\)](#)

[Appendix 5 – Example of Assessment on Attitude \(Teacher as observer\)](#)

[Appendix 6 – Example of Task Sheet for Each Module](#)

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BEATTY SECONDARY SCHOOL

Syllabus Outline for Modular Approach (Sec 1 E) – **DESIGN APPRECIATION**
(Based on 15-week model)

Module 1

Duration	Module / Contents	Assessment / Assignment	Resources
6 periods (2 weeks)	Module 1 Introduction to D & T Product Analysis	Group work Each group will identify a product and they will be required to give a presentation and discuss: <ul style="list-style-type: none"> • how the products are designed to suit different needs. • the aesthetics in terms of shapes, colours, textures, etc, • the materials. • safety / security features • function (Oral presentation – 30%) (Contents – 70%)	<ul style="list-style-type: none"> • Worksheet • Task sheet • Any products that the pupils are familiar with, eg. handphones, toys, footwear, bags, watches etc.

Duration for each module

Modules as independent units

Modes of assessment

Module 2

Duration	Module / Contents	Assessment / Assignment	Resources
6 periods (2 weeks)	Module 2 Communicating Through Design Isometric Drawing This module is preferably done after pupils have been taught freehand sketching of lines and shapes. (*Freehand sketching of lines and shapes, toning, shading and textures will be done in art.)	Individual work <ul style="list-style-type: none"> • Each pupil is to select a product related to a given theme. Practise sketching the product in isometric view. Bring the product to school on the day of “test” and complete the isometric sketching of the product within 30 minutes. (Pupils are encouraged to practice the sketching as many times as they can before the “test”.)	<ul style="list-style-type: none"> • Worksheet • Task sheet • Pupils’ own choice of product related to given theme.

Content integration – Art & D&T

Pupils take ownership of own learning and success.

BEATTY SECONDARY DESIGN & TECHNOLOGY UNIT

The Dramatisation Approach (D.A.P) in

The Creative Design Process...

Introduction

From 2006, Beatty's Design & Technology (D&T) unit has spearheaded the **Dramatization Approach (DAP)** in the teaching and learning of D&T. This is a unique approach to help pupils appreciate and learn about the creative design process. This is also part of the school's efforts to incorporate and infuse the Creative Arts within and across disciplines.

In essence, DAP allows pupils to 'dramatise' or 'act out' the design problem, process and the 'solution.' In groups, pupils come together to discuss a 'problem' and a corresponding scenario which will then be scripted as a short skit. Through the performance of this skit, the groups will show how they

- carry out research on the problem identified
- explore a wide variety of imaginative ideas
- develop these ideas further before converging on the best possible solution
- prototype the selected solution which will finally be evaluated against the specifications through testing.

The whole design process will be captured on video as a pedagogical tool.

A total of 8 classes of will be involved comprising five Sec 2 Express and three Sec 2 Normal (Academic) (3) D&T classes.

Rationale

'Dramatising' a problem situation is a lot of fun as it simulates the brain at work. Pupils are more motivated to solve real-life problems as it is enjoyable, entertaining and at the same time, spontaneous. The real-time scenario allows observers to appreciate the design problem and see how a solution is gradually emerged and evaluated. It trains pupils to evaluate the solution through objective appraisal.

This is also a powerful means of engaging the students mentally, physically and emotionally to demonstrate the benefits of the design process and the product rather than observing it merely on 'paper' as a drawing or even simply as a 3D model.

Evaluation & Assessment

This content area forms a module entitled 'Design Approaches' in the Sec 2 curriculum which is a follow-up from the recently redesigned Sec 1 curriculum using a modular approach. This module will now comprise of 'Many Ways of Seeing' and the 'DAP' approaches in design problem solving and will constitute 10 % of total assessment grades. A new set of assessment rubrics will be drawn up to guide teachers.

Some possible Outcomes


- The 'video clips' of the skits can be used as a teaching and learning tool.
- The prototypes or projects can be exhibited. If it is not possible to display the physical projects, they can be converted into digital images in A3 size posters with a short write-up. To complement these images, award winning project images can also be displayed, including the latest, ' Revolutionary Camera Stand' which was awarded a 'Creative Adaptation Award' in a coursework competition organized by Ministry of Education's D & T Unit.
- Pupils' level of confidence will be increased and they are better able to make effective and convincing presentations in public. It also promotes innovation, teamwork and provides a platform for drama enthusiasts to sharpen their acting and oral communication skills.

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Jan 2006

Module 1 : Design Approaches – Dramatisation Approach

	<h1 style="margin: 0;">Mark Sheet</h1>	Name: Class: Date:
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Script

	Descriptor		Descriptor		Descriptor
<i>Score</i>	Plot (3)	<i>Score</i>	Content (4)	<i>Score</i>	Presentation of Script (3)
3	A well-thought through plot showing evidence of <ul style="list-style-type: none"> • cause and effect / climaxes • variety of pace 	4	<ul style="list-style-type: none"> • Theme is clearly brought out by the plot • Audience is able to understand “The design Process” in real life context through the plot. 	3	A script with <ul style="list-style-type: none"> • sequential introduction to the plot, characters, setting, props, etc. and • attention to the details in the development of the plot
2	A plot showing evidence of some cause and effect / climaxes	2-3	<ul style="list-style-type: none"> • Theme is clearly brought out by the plot. • Evidence of stages of “The design Process” in real life context, though vague. 	2	A script with <ul style="list-style-type: none"> • sequential introduction to the plot, characters, setting, props, etc. <u>but</u> • lacking in attention to the details in the development of the plot
1	A mere succession of events	1	Theme is not clearly brought out by the plot.	1	<ul style="list-style-type: none"> • A script lacking in sequence and • without proper introduction to the plot, characters, setting, props, etc.

Drama

(Individual – Characterisation)

<i>Score</i>	Descriptor	<i>Score</i>	Descriptor	<i>Score</i>	Descriptor	<i>Score</i>	Descriptor
	Preparation (2)		Commitment (3)		Voice / Diction (3)		Movement (2)
2	Lines are mastered. Surprises handled with poise.	3	<ul style="list-style-type: none"> Shows interest in the company. Engaged for most of the scene. 	3	Projects with authority. Speech expresses style and character.	2	Posture and movement express style and character. Use of space allows good visibility.
1	Some line problems. Surprises shake concentration and cause some problems.	2	<ul style="list-style-type: none"> Shows little interest. Needs more emotional connection. 	2	Audible, but some pitch or projection problems. Speech can fit with character and style.	1	Posture or movement is sometimes out of character. Use of space occasionally causes problems for visibility.
		1	Shows no interest. Emotion lacking or inappropriate.	1	Projection weak at times. Does not express character and style.		

(Team)



<i>Score</i>	Descriptor	<i>Score</i>	Descriptor
	Props (2)		Coordination (3)
2	Props are being adequately and appropriately used to enhance visual effects.	3	<ul style="list-style-type: none"> Team is well coordinated. Role of each member in the team is well defined and portrayed.
1	Little use of props.	2	<ul style="list-style-type: none"> Evidence of some coordination and organization. Lacking in continuity at times.
0	No use of props.	1	<ul style="list-style-type: none"> Team lacks coordination and organization Lacking in continuity at most of the times.

Module 1 : Design Approaches – Dramatisation Approach

	<h1>Evaluation</h1>	Name :	
		Class :	
		Date :	

Peer Evaluation

My understanding of the design process through the skits presented is :

 (Please circle.) 

1 2 3 4 5

Which group do you think has the best formulated problem?

1 2 3 4

Why? (Please elaborate)

How do you think you can improve/further develop their proposed solution to the problem?
(You can illustrate with sketches.)

Who do you think has acted well in the skit? Why?

Self Evaluation

At the end of the module, I have learned the followings (List 2 points) :

a)

b)

I identify an area that you think you can improve further.

My group members are :

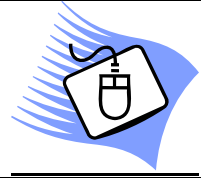
Group Evaluation

What have I contributed in this group work?

Who has contributed the most in this group work? (Please elaborate on what he/she has contributed)

Who could have contributed more in this group work? (Please suggest an area(s) for his/her improvement).

Module 3 : Materials



Task Sheet

Name :

Class :

Date :

- 1) Grouping
Work in groups of 4.



Learning through self-discovery

- 2a) Task 1
Observe around and take pictures of objects made of different materials.
- b) Using at least 12 photographs, do a photomontage that best tells the different types of materials around you.
- 3a) Task 2
Identify 3 products around you (at home or in school) such that each is made from wood, metal and plastics.
- b) In each case:
- describe the appearance of the material and explain why you think the material has been used. (To start you off, refer to Pg 55 of your textbook!)
 - suggest an alternative material for the product and give reasons for your choice.
- c) Present your analysis.
(Remember! Powerpoint slide presentation is just one of the many ways to present. What are the other forms of presentation that you can think of? Put on your creativity cap and be different!)

Encouraging creativity