Exploring the Use of Evaluation Models to Inform Curriculum Planning and Development

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Introduction

This paper examines the relevance of evaluation in curriculum planning and development, with a specific focus on the Singapore context. Singapore is a small nation devoid of natural resources, with a population of approximately four million people; her only resource is her people. Singapore’s wealth as a nation lies in its people and by implication, in its people’s education and the mission of the Singapore Education Service is to mould the future of the nation, by moulding the people who will determine the future of the nation (Mission and Vision, n.d.). The importance and value of education reform is Singapore’s “most important strategy for long term economic competitiveness” (Shanmugaratnam, 2002). Economic survival is determined by a nation’s ability to develop, adapt to constant technological advancements and lead in the areas of research and innovation. It is therefore necessary that Singapore’s education prepares her people to keep abreast of changes and advances (Ministry of Education, 2002).

Education reform and policy development in Singapore have been dynamic. The education system in Singapore has evolved dramatically over the last thirty years to keep up with the changes and innovations around the world. In addition, the Ministry of Education’s (MOE) broad directions and guidelines provide schools with autonomy and flexibility to implement school programmes that are based on their students’ profile and staff competencies. Therefore, curriculum evaluation is imperative to meet the changing needs of
stakeholders. Stakeholders here include ministerial bodies, educational bodies and institutions, school-leaders, teachers, parents and students.

Building strategically on the strengths of school autonomy and its accompanying innovations, the Singapore education system has been able to offer its stakeholders even greater choice and flexibility in recent years. Over the last five years, new types of schools have emerged. The introduction of specialised independent schools such as the Singapore Sports School, the National University of Singapore (NUS) High School for Mathematics and Science and the Singapore Arts is to allow students with special talents to hone their abilities through a more focused and specialized education that would bring out the best in them.

With the increasing diversity and flexibility in Singapore’s education landscape, schools have been accorded greater autonomy to make local decisions and timely improvements to curricula and education programmes to enable them to be more responsive to student needs. This is especially so in the light of Singapore’s ‘Teach Less, Learn More (TLLM)’ vision of education where schools are called on to ‘teach less to our students so that they will learn more’ (Lee, 2004). TLLM aims to achieve ‘engaged learning in every classroom, by every teacher, for every child’ (Ho, 2006). In other words, TLLM aims to improve the quality of learning in individual schools through a range of broad-based and differentiated school-based curriculum efforts responsive to student needs. Therefore, a practitioner-centric and localised evaluation of these curriculum efforts is crucial in assessing the extent to which their objectives are achieved.

**Evaluation Models**

This paper examines three commonly referred-to evaluation models, namely Scriven’s Formative-Summative Approach (Scriven, 1967), Stake’s Countenance Model (Stake, 1967) and Stufflebeam’s CIPP Model (Stufflebeam, 1987). Each model is analysed for potential practitioner-centric
features as well as limitations in the evaluation of curriculum planning and development in Singapore.

**Scriven’s Formative-Summative Approach**

Scriven (Scriven, 1967) first distinguished between formative and summative roles of evaluation. His Formative-Summative Approach is defined as an objective evaluation of the worth or merit of an object. In the education context, this object may be a curriculum or an education programme. Formative evaluation is conducted during the operation of a programme to provide feedback useful such as in improving the programme, its direction, focus, content and delivery. Summative evaluation is conducted at the end of the programme to provide stakeholders with feedback about the programme’s worth, merit, or value. Screen’s model also emphasises meeting the needs of stakeholders - namely students, teachers, parents and employers - and evaluation is accomplished through the judgement of the education product by independent evaluators. Given Singapore’s varied education landscape and policy of school autonomy, Scriven’s approach is a useful concept for schools to evaluate their own programmes and compare educational outcomes. However, specific tools are needed in making meaningful comparisons across schools.

**Stake’s Countenance Model**

Stake’s Countenance Model (Stake, 1967) focuses on the evaluation of intents rather than the actual educational goals. Stake’s model is practitioner-centric in its requirement. The evaluation examines the rationale of the education programme such as the background philosophy and purpose for which the programme was developed. These intents refer to the goals and plans of the practitioners, such as the curricula and education programme planners, teachers and students. The model takes into consideration the complex school environment faced by practitioners and the antecedent
conditions of teachers and students. These together with the dynamism of classroom transactions are important factors when evaluating the teaching and learning processes.

Stake’s model places importance on the observation, description and judgment of the programme, via a variety of data sources and multiple analyses which call for documentation of antecedent conditions, transactions - in this context, between practitioners and stakeholders, and programme outcomes. While admittedly focusing on the intents of an education programme, the model’s data collection approaches seek to detect the congruence between these intents, the processes - influenced accordingly by factors such as antecedent conditions and transactions between practitioners and stakeholders, and programme outcomes intended.

Stake’s model’s strength is in being participant-oriented in its emphasis on the ‘voice’ of stakeholders. While Scriven’s emphasis on judgement of an object based on accumulated evidence, Stake’s model relies heavily on data based on an evaluator’s observations and judgement. It is labour-intensive and evaluator-sensitive. Again, as with Scriven’s approach, there are limitations in employing Stake’s model to make meaningful comparisons across schools in Singapore’s education system.

**Stufflebeam’s CIPP Model**

The CIPP Model (1971) developed by Daniel Stufflebeam and associates - differs from Scriven’s and Stake’s in that it is a decision-making model. It has a management-orientation in its approach to educational evaluation and aims to facilitate effective decision-making. In evaluating an education programme, the CIPP model examines the needs and goals assessment, inputs and resources, processes and the programme’s impact and outcomes. The CIPP model is also practitioner-centric and it is useful for both formative as well as summative evaluation. In other words, it enables decision-makers to track the
accountability of a programme from its inception, conduct on-going appraisal as well as assess programme outcomes.

However, the CIPP model can be limiting in that evaluation is driven by decision-makers’ such as policy-makers and school-leaders need for information, with the inquiry also necessarily prescribed by these decision-makers’ concerns and questions. Whilst the model takes into account the stakeholders’ perspectives, concerns and needs, such an evaluation could potentially overlook the former in favour of the client such as the decision-maker’s interests or intents. This in fact is a common criticism of the CIPP model. Unlike Scriven’s approach, which places importance on the judgement of an independent evaluator, the CIPP model’s top-down approach could potentially disenfranchise other stakeholders or intended beneficiaries of an education programme. As Singapore schools are increasingly required to involve and to take into account the views of other stakeholders and intended beneficiaries of education programmes; the CIPP model may not be able to serve the local context.

**Evaluating Curricula in Singapore**

Singapore’s schools are encouraged to aspire towards and attain the TLLM vision of a holistic educational experience – to engage every child and develop fully his interests and abilities. An evaluation model that would be relevant to the schools’ decision makers as well as stakeholders’ would be one that facilitates stakeholder ownership and allows for periodic review and appraisals of processes such as Organisational Excellence Models (OEMs).

**Organisational Excellence Models (OEMs)**

OEMs are frameworks developed to guide organisations towards achieving success in various forms across the world (EFQM: The Fundamental Concepts of Excellence, n.d.). Examples are the Malcolm Baldrige National
Quality Award (MBNQA) model (Malcolm Baldrige National Quality Award, n.d.) and the European Foundation for Quality Management (EFQM) Excellence Model (EFQM Excellence Models (n.d.). The MBNQA was established in 1987 and is presented annually by the President of the United States to organisations that demonstrate quality and performance excellence (National Institute of Standards and Technology, 2001-2007). The EFQM Excellence Model was introduced in 1992 and is widely used as an organisational framework in Europe as a tool for self-assessment, to benchmark with other organisations and to guide improvement. It is also a framework for assessing organisations for the European Quality award.

The EFQM focuses on integrated systems, processes and benchmarking for continuous improvement. Like the CIPP model, the MBNQA model and the EFQM are built on management principles from industries and offer a shift in thinking about education and school management. The concepts and criteria for these two models are summarised in Table 1.

<table>
<thead>
<tr>
<th>Concepts and Criteria Of EFQM and MBNQA</th>
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<tr>
<td>European Foundation for Quality Management Excellence Model</td>
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<tr>
<td>Eight Fundamental Concepts:</td>
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<tr>
<td>1. Results Orientation</td>
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<tr>
<td>2. Customer Focus</td>
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<tr>
<td>3. Leadership &amp; Constancy of Purpose</td>
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<tr>
<td>5. People Development &amp; Involvement</td>
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<td>8. Corporate Social Responsibility</td>
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The OEM characteristics make them useful as criteria for awards. Like the CIPP model, the MBNQA model and the EFQM emphasise decision-makers’ intent, providing self-assessment scores in the summative assessment of the programmes.
Both the MBNQA model and the EFQM have been used in education sectors. Originally conceived for organisations in the manufacturing, service and business sectors, MBNQA was extended to the education sector in 1999, with the criteria (see Table 1) being adopted by education organisations in the United States of America (Malcolm Baldridge National Quality Award, 2007). The MBNQA has provided opportunity for education organisations to benchmark and improve their organisation’s performance that would be otherwise too costly to purchase on the open market. In Europe, the EFQM provides a system for reviewing key activities and results and has been adopted in various education systems, such as, the Scottish ‘How good is our school? Self-evaluation using performance indicators (HGIOS)’, the ‘Hungarian Quality Award for Public Education’ (HQAfPE) and the Spanish ‘Education Quality Award’. The HGIOS, for instance, is an evaluation framework developed in 1999 and has been used by Scottish schools to carry out planning and evaluation.

Similarly in Singapore, the Singapore Quality Award (SQA) is an OEM for organisations to evaluate themselves. Launched in 1994, the SQA is the highest accolade given to organisations for business excellence in Singapore and was later adapted for education evaluation in Singapore schools.

The School Excellence Model

The School Excellence Model (SEM) is an OEM derived from the SQA which is currently used in the Singapore education context, given its parallel emphasis on an integrated, process-driven evaluation and benchmarking for improvements (as with the MBNQA and the EFQM tools). Schools began conducting their self-appraisals using the SEM in 1999 (Ng, 2003).

The SEM is a self-assessment model that schools use to evaluate their academic results and schools’ processes. The study of the processes and results separately, helps schools to identify areas for improvement in curriculum planning and development more effectively. Previously, the appraisal system involved a team of school inspectors and curriculum
specialists from the Ministry of Education who examined school reports, observed lessons and interviewed students and teachers. These external assessors prepared reports with recommendations for curriculum improvement. In contrast, SEM places the onus of school curriculum planning and development on the school itself by encouraging self-assessment as a means to identify school directions.

However, the SEM has provisions for Singapore schools to be externally validated from time to time, so that schools’ self-assessment can be enhanced with external perspectives. External validation teams include members from outside the education fraternity so that the practices in schools can be compared against good practices in commercial organisations and industries (Teo, 2002).

As an evaluation tool, SEM requires schools to continuously question their current practices and established norms, and think of more effective and innovative ways of delivering educational outcomes. SEM is holistic because of its emphasis on the connections between different school programmes and activities and its recognition of non-academic developments or results. Furthermore, SEM allows schools to benchmark processes against other schools, other educational or public sector organisations and commercial organisations where appropriate when schools develop a programme for improvement.

Since its introduction in 1999, schools have viewed the SEM as a fairer evaluation system as it shifts emphasis away from a dependency on examination results (New System, 1999) while other schools have indicated that the tool has helped improved their curriculum processes (Trial schools, 2000). Unlike the previous evaluation models assessed, the SEM is not a ‘one-size-fits-all’ system and recognises that there are many different approaches to achieving sustainable excellence and therefore is better suited to Singapore’s varied education landscape.
The effectiveness of adopting the principles of OEM as an evaluation tool for educational purposes may be observed further through the following case-study of evaluating the arts education programme in Singapore schools.

**Evaluation of Arts Programme – A Case Study**

Since SEM’s introduction to Singapore schools as a self-appraisal system, it is also used for the evaluation of specific education programmes. In 2001, Singapore’s Ministry of Education, Curriculum Planning and Development Division, launched the ‘Guidelines on the Promotion of Arts Education’ (Arts Guide, n.d.) as part of the national efforts to enhance arts education in schools. The ‘Arts Guide’ comprises of two parts. The first contains a case study to guide conceptualising, planning and implementation of the arts curriculum and the second provides an evaluation framework (referred to as the Arts Evaluation Framework) with rubrics for programme evaluation.

**Arts Education Evaluation Framework**

The Arts Education Evaluation Framework (AEEF) contains many SEM features². For example, the AEEF questionnaire is used to examine the processes and the results of the arts curriculum. Like the SEM, the AEEF is non-prescriptive. It provides schools with a guide to conduct a comprehensive and systemic review of their programmes and results. It is also a management tool for developing good practices in planning, implementation, monitoring and review of the arts curriculum in schools. Familiar with the effectiveness of the SEM tool, schools accepted the AEEF as a modified version of the SEM for the specific evaluation of the arts curriculum. Moreover, due to its effectiveness as an evaluation tool, from 2002, the AEEF was adopted by the National Arts Council to evaluate applicants for the National Arts Education Award (NAEA) in Singapore. The award aims to recognise schools that provide a meaningful, enriching and enjoyable arts learning experience to their students through a holistic arts programme.

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² Refer to Appendix A.
The AEEF is structured on three criteria. Each criterion has three to four domains. Each domain is delineated by a number of performance indicators. A questionnaire was developed based on these indicators. The domains are broadly classified as ‘process’ domains and ‘results’ domain.

**Process domain**

The ‘Process’ domains are evaluated based on the following elements: approach, deployment, assessment and review. Evidence of good processes is the adoption of a sound and integrated approach, systematic implementation and regular assessment and review for improvement.

**Results domain**

The ‘Results’ domains are assessed based on evidence of positive trends, the meeting of appropriate targets, as well as favourable comparisons with similar schools and organisations. Sustained results are also those that can be shown to be caused by sound approaches.

**Assessing the Arts Education Evaluation Framework**

The usefulness of the Arts Education Evaluation Framework was assessed based on three factors: (a) development and validation; (b) reliability; (c) usability and usage; and (d) meeting objectives of evaluation.

**Development and Validation**

_Schools initially found the AEEF difficult to use. Schools’ feedback indicated that collecting and producing evidences, tracking trends and other paper work involved were tedious and time-consuming. In response to schools’ feedback,_

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3 Refer to Appendix B for overview of evaluation framework.
4 Refer to Appendix C for sample items from the AEEF Questionnaire.
the AEEF questionnaire was revised and simplified. Four criteria were reduced to three; fourteen domains were reduced to ten; 53 indicator statements were reduced to 34 and 35 for primary and secondary levels respectively. The revised structure was achieved through merging of similar indicators or incorporating them under broader statements.

Reliability

Table 2:
Reliability of Each Criterion

<table>
<thead>
<tr>
<th>Sections</th>
<th>No of Items</th>
<th>Cronbach's Alpha</th>
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<tbody>
<tr>
<td>Criterion 1</td>
<td>8</td>
<td>0.90</td>
</tr>
<tr>
<td>Criterion 2</td>
<td>16</td>
<td>0.94</td>
</tr>
<tr>
<td>Criterion 3</td>
<td>10</td>
<td>0.91</td>
</tr>
</tbody>
</table>

The 34-item questionnaire has three sections. Using the raw scores of 74 primary and 45 secondary schools, the reliability coefficient was computed in the three sections. Table 2 shows the reliability coefficients of the three criteria.

Usability and Usage

Table 3:
Rising Number of NAEA Application (2003-2007)*

<table>
<thead>
<tr>
<th>Award</th>
<th>2003 (Sec)</th>
<th>2004 (Sec)</th>
<th>2005 (Pri)</th>
<th>2006 (Sec)</th>
<th>2007 (Pri)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. of applications</td>
<td>17</td>
<td>31</td>
<td>41</td>
<td>45</td>
<td>33</td>
</tr>
</tbody>
</table>

*These figures are out of a total of 175 primary (pri) and 167 secondary (sec) schools. The NAEA is open only to the primary or secondary level in each year.

Since the NAEA uses the framework as its award criteria, schools applying for the Award would need to evaluate themselves using the framework and to provide evidence to support their own ratings. Officers from the National Arts Council and the Ministry of Education would validate the schools’ assessment to select the winning schools. Since its implementation, from 2003 to 2007, an
increased use of the Arts evaluation instrument was observed. This has been further reflected in the number of applications to the National Arts Education Award captured in Table 3.

Meeting objectives of evaluation

The objective of the AEEF evaluation was to improve schools’ systems and processes in the area of arts education. Generally, the external evaluators of the NAEA observed an improvement in both the raw scores given by the schools and moderated scores given by the assessors over the years. Schools seemed to have been encouraged to put in place and improve their processes in the area of arts education using the AEEF criteria. Moving forward, the Ministry is examining how the tool can be further refined and to encourage schools to use the tool as a continuing system of self renewal.

Conclusion

The use of OEMs in the specific evaluation of education programmes in Singapore is still in its infancy. While its emphasis on an integrated approach with regard to process and product is acknowledged and valued, OEMs do not seem to fully facilitate decision-makers’ in-depth examination or reflection on the intents of their programmes as advocated in Stake’s model or outlined as context and input in the CIPP model. Decision-makers’ sustained, reflective examination of the intents of their programmes is crucial, especially in the instances when intents closely impact the effective translation and implementation of education programmes in schools.

Further work needs to be undertaken to study the effects and impact of applying an excellence model in education evaluation. In the Singapore education context, the use of the OEM-inspired SEM and the AEEF enable schools to benchmark their performance against other schools but also against external organisations. The approach is customer-centric, with customer satisfaction being one of the most important outcomes. The measure of ‘excellence’ for education institutions might not be synonymous to
that used for corporate organisations. In corporate organisations, the bottom line is profits margin. In education, intrinsic outcomes such as character development, the nurturing for life-long learning, teachers' care and concern, students' attitudes and motivation to arts learning are important elements of education. Although they are difficult to measure, it does not mean that they cannot be assessed.

Refining existing evaluation frameworks to enhance curriculum planning and development will continue in Singapore. The Ministry of Education aims to increase involvement of all stakeholders in the evaluation process through focus group discussions and consultations with policy-makers, school leaders, students, parents and partners from the industry and Institutions of Higher Learning, to strengthen effective benchmarking efforts of Singapore's curricula and education programmes. Continuous relevance, rigour and responsiveness to change, both internally, among schools and externally, with business organisations and overseas curricula and programmes are likely to be increasingly important as Singapore seeks to prepare her young for a global future.
References


APPENDIX A

COMPARISON OF THE SEM AND ARTS EDUCATION EVALUATION FRAMEWORK

**School Excellence Model (SEM)**

- **0 Criteria**
  - **6 Criteria**
    - **4 Enablers**
      - **22 Sub-criteria**
      - **67 Areas**
    - **4 Results**
      - **10 Sub-criteria**
      - **28 Areas**

**Arts Evaluation Framework**

- **4 Criteria**
  - **2 Enablers**
    - **Criteria 1 & 2**
      - **7 Sub-criteria**
      - **11 Areas**
  - **1 Result**
    - **Criteria 3**
      - **3 Sub-criteria**
      - **3 Domains**
  - **1 Result**
    - **Criteria 4**
      - **11 Indicator Statements**

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**CRITERION 1: LEADERSHIP**
This criterion examines how the school leadership and the school's strategic planning is directed and how the school's actions align to support the direction. It outlines how the school leader and the staff are aligned and how they leverage the school's strengths.

**CRITERION 2: STRATEGIC PLANNING**
This criterion examines how the school's strategic planning is directed and how the school's actions align to support the direction. It outlines how the school leader and the staff are aligned and how they leverage the school's strengths.

**CRITERION 3: STAFF MANAGEMENT**
This criterion examines how the school leader and the school's strategic planning is directed and how the school's actions align to support the direction. It outlines how the school leader and the staff are aligned and how they leverage the school's strengths.

**CRITERION 4: RESOURCES**
This criterion examines how the school leader and the school's strategic planning is directed and how the school's actions align to support the direction. It outlines how the school leader and the staff are aligned and how they leverage the school's strengths.

**CRITERION 5: STUDENT-FOCUSED PROCESSES**
This criterion examines how the school leader and the school's strategic planning is directed and how the school's actions align to support the direction. It outlines how the school leader and the staff are aligned and how they leverage the school's strengths.

**CRITERION 6: ADMINISTRATIVE & OPERATIONAL RESULTS**
This criterion examines how the school leader and the school's strategic planning is directed and how the school's actions align to support the direction. It outlines how the school leader and the staff are aligned and how they leverage the school's strengths.

**CRITERION 7: STAFF RESULTS**
This criterion examines how the school leader and the school's strategic planning is directed and how the school's actions align to support the direction. It outlines how the school leader and the staff are aligned and how they leverage the school's strengths.

**CRITERION 8: PARTNERSHIP & SOCIETY RESULTS**
This criterion examines how the school leader and the school's strategic planning is directed and how the school's actions align to support the direction. It outlines how the school leader and the staff are aligned and how they leverage the school's strengths.

**CRITERION 9: KEY PERFORMANCE RESULTS**
This criterion examines how the school leader and the school's strategic planning is directed and how the school's actions align to support the direction. It outlines how the school leader and the staff are aligned and how they leverage the school's strengths.
APPENDIX B

OVERVIEW OF THE EVALUATION FRAMEWORK

Criterion 1. School Policy and Planning

1.1 Policy on Arts Education
The articulated policy on arts education addresses the pursuit of a holistic education. The policy is aligned with the school vision and mission.

1.2 Cascading of Policy and Planning
The long-term goals for the arts programme are translated into short-term goals and cascaded to the working units within the school.

1.3 Approach to Arts Education
The school’s policy on arts education is implemented through a well-conceived and coherent whole-school approach.

Criterion 2. Implementation of Programmes

2.1 Arts Programme
The arts programme, conducted in a positive learning environment, caters to the interests and needs of students.

2.2 Development and Deployment of Staff
The school identifies and provides for the training needs of its teachers and ensures their appropriate and optimal deployment.

2.3 Resources for Teaching and Learning
Sufficient resources for teaching and learning of the arts are provided and managed to ensure their optimal use.

2.4 Collaborations with other organisations
The school collaborates with relevant partners to achieve the goals of its arts programme.

Criterion 3. Arts Achievement and Culture

3.1 Achievement in the Arts
The school achieves positive results in the arts.

3.2 Resources Support
The school has harnessed its resources effectively to deliver and support its arts programme.

3.3 Arts Culture in School
There is a vibrant arts culture in the school.
APPENDIX C

SAMPLE ITEMS FROM THE AEEF QUESTIONNAIRE

CRITERION 1: SCHOOL POLICY AND PLANNING

1.1.1 The arts education policy is explicit and is aligned with the school vision, mission and values.

1.2.1 The arts department’s unit workplans are cascaded from the goals.

CRITERION 2: IMPLEMENTATION OF PROGRAMMES

2.1.1 The arts programme provides students with exposure to a range of art forms.

2.2.3 The school evaluates the impact of training and staff deployment on the outcomes of its arts programme.

CRITERION 3: ARTS ACHIEVEMENT AND CULTURE

3.1.1 Students participate in arts activities