

# Using Outcomes Reporting for High Stake Examination to Enhance Learning

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## Abstract

The importance of assessment and reporting against learning outcomes is central to the concept of “assessment for teaching and learning”. The marked shift toward outcomes-based assessment and reporting on specific learning outcomes makes little sense without the development of a suitably modelled approach.

Technological advance provides avenues to expedite the capturing of marked exam/assessment responses for individual students. Mechanisms allow storing and processing of a large amount of detailed information relating to a whole range of specific outcomes and achievement levels for individual students. This advancement made possible the creation of a new model for outcomes-based assessment and reporting.

Lacking outcomes-based assessment and reporting at a specific and detailed level (in the Pacific) has been the result of the following.

- Norm-referenced approach of assessments still prevalent despite curriculums being outcomes-based.
- Assessments are based on very general learning outcomes (achievement standards) with differences between teachers and examiners in the unpacking and interpretation of skill levels of learning outcomes.
- An absence in capacity for capturing, storing and processing detailed assessment data.
- Lack of a model that can produce outcomes-based assessment and reporting at specific levels of achievement.

The new approach on outcomes-based assessment and reporting emerges through analysis of current assessment and reporting models in the Pacific as well as exploratory simulation. The merits of the new model include:

- Enables reporting of achievement of specific learning outcomes
- Provides a basis for common understanding of subject specific learning outcomes and therefore allow comparability in assessment results
- Serves the assessment concept “Assessment for Teaching and Learning”
- Eliminates the need for post-exam scaling in a ranking and selection environment
- Removes the need for marks in assessment and reporting

This new model guarantees providing more appropriate information to students on the status of their learning, more appropriate feedback to teachers on student learning, and enables more appropriate intervention for student learning, resulting in a potentially more effective learning society.

**Keywords:** Specific Learning Outcomes; Learning Outcomes Skill Score; Outcomes-based Reporting; IT integration.

## **Introduction**

The current form of reporting high stake examinations in the South Pacific is primarily a mechanism for selection either into tertiary institutions or for scholarship selection. This has been, and will continue to be, an important function for senior secondary school qualification.

A regional seventh form qualification – South Pacific Form Seven Certificate (SPFSC) administered by the Secretariat of the Pacific Board for Educational Assessment simply establishes a rank order of achievement without any definition of that achievement. Little can be deduced from this reporting system that would effectively provide information on the specific learning achievements of students, as the grading system is based merely on aggregated marks.

The shift of focus from ranking and selection towards monitoring the quality of student learning and reporting on student achievement in subject learning outcomes is of high value to all stakeholders.

While continuing to meet member country needs for a selection instrument, SPBEA recognized the limitations of the instrument for reporting the quality of student learning and achievement of the various learning outcomes.

Given the need for an assessment and reporting approach and tool that is current and in line with the worldwide trend, the challenge was more than just identifying and securing an approach. An assessment and reporting approach appropriate to the Pacific Island countries' context was of paramount importance.

In the development of a suitable assessment and reporting approach for Pacific island countries, *outcomes-based* was the guiding concept. Although the outcomes-based concept is not new, the approach is. The need is to report individual students' achievement of specific learning outcomes to enable teachers to refocus teaching and make specific intervention where appropriate. As reporting of student achievement is an end product of the assessment process, it is considered more meaningful to present the approach in its totality.

The aim of this paper is to present an approach to the assessment process which enables reporting of student achievements that will enable the enhancement of teaching and learning.

## **Outcomes-based Assessment and barriers to implementation**

Outcomes-based reporting is a product of outcomes-based assessment and the success of any attempt to report achievement of learning outcomes depends on accomplished outcomes-based assessment.

Outcomes-based assessment has several definitions. Regardless of which definition one is examining, the idea of continuous improvement is often a common element (Allen, 2004; Maki, 2004; Suskie, 2004). Using continuous improvement in the definition, there is an assumption of purposeful planning for the delivery and assessment of intended outcomes. In addition, the assessment process is designed so the information gathered could be used to inform specific decisions about how the intended outcomes can be met at a greater level of quality.

The question is, why the practice of outcomes-based assessment is not pervasive even in countries and schools whose leadership emphasises the importance of such a process to improve student development and learning?

Research has been conducted to illustrate the common barriers to implementing outcomes-based assessment. The reasons that outcomes-based assessment is not pervasively practiced or practiced at all

are often classified into three categories: (a) time, (b) resources, and (c) understanding of assessment (Banta, 2002; Bresciani, 2006; Palomba & Banta, 1999; Upcraft & Schuh, 1996).

**Time** - Research posits that the manner in which one allocates time is influenced by how one prioritizes one's values (Argyris & Schon, 1996; Dalton, Healy, & Moore, 1985). As such, human beings, regardless of their profession, will allocate their time that is devoted to work based on what they value or what they are told to value by those responsible for evaluating job performance (Bass & Avolio, 1994). The outcomes-based approach with the purpose of monitoring and intervention is seen by many teachers as additional loads to teaching. PNG Post Courier reported that outcomes-based assessment has come to a situation where there is heavy workload on teachers for programming lessons which produces incomplete teaching and learning (PACNEWS 2, 2013).

**Resources** - Resources have been presented as a reason that people do not engage in outcomes-based assessment citing the actual costs of implementing outcomes-based assessment often go uncalculated. Furthermore, the start-up costs of educating personnel to learn how to implement effective, efficient, and enduring outcomes-based assessment are often never allocated (Upcraft & Schuh, 1996). Because the actual cost of engaging in outcomes-based assessment has not been systematically calculated, it is difficult to determine whether the perceived or actual costs of professional development are off-set by improved student learning.

**Understanding of assessment** - Higher education apparently has been nervous with "flavour of the day" processes and reporting initiatives (Banta, 2002). As such, schools and administrators are often wary of anything else that comes along in an apparently pre-packaged version or with the threat of an unfunded mandate.

While outcomes-based assessment has been around in one form or another for quite some time (Bresciani, 2006), the assumption that it is really here to stay is understandably questioned because the manner in which outcomes-based assessment has been labelled has changed over the years. In addition, the increasing emphasis on accountability, using standardized testing and other performance indicators that often cannot be linked to what is actually occurring in the classroom causes further understandable confusion.

There have been several resources and approaches designed to assist school and administrators with implementation of outcomes-based assessment yet many schools are still having difficulty meaningfully engaging in the process. Why is that?

### **Issues and Challenges**

Teaching, learning and assessment at the end of senior secondary education is a challenge in the Pacific islands. Resources are barely minimal and insufficient in most schools and with those currently providing SPFSC qualification, where more than 40% of the teachers have not taken formal teacher training. (SPBEA, 2013) Compounding these problems, there is an absence of national sixth and seven form curricula resulting in SPBEA subject prescriptions being used in schools as teaching documents.

With the attempt to adopt outcomes-based assessment and reporting at a specific and detailed level, several problems in existing systems were identified.

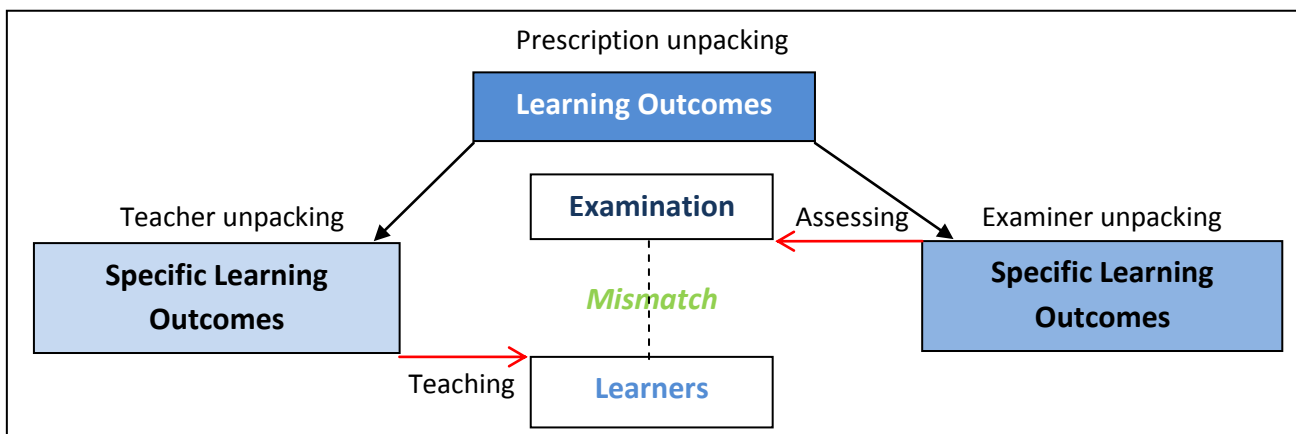
#### ***Teaching/learning – assessing mismatch***

The vital problem was that with unpacking of the learning outcomes presented in the SPFSC subject prescription documents. Although learning outcomes were outlined within the prescriptions, these were broad and not clearly presented in a way that was very helpful for either the teachers or the

examiners. In the Pacific the unpacking of prescription broad learning outcomes to make them more specific and clear was assumed role of teachers and examiners. These skills are taught at teachers colleges and institutions as well as in professional development workshops. However, even with teachers having complete formal teacher training, their competencies vary. Coupled with a considerable number of untrained teachers and examiners this results in a teaching – assessing mismatch. According to findings from schools in PNG by the Japan International Corporate Agency (JICA) Study Team on implementation of outcomes-based assessment, syllabus and teacher guides had unclear contents. “Teachers have to guess the meaning and can never know if she or he is right or not,” said a representative from the JICA team (PACNEWS 2, 2013)

*Diagram 1* below depicts this mismatch. Teachers unpack prescription learning outcomes according to their understanding and plan their teaching around their unpacked learning outcomes. Examiners may possess a different understanding of unpacking thus unpack the same prescription learning outcomes based on their understanding and design assessment tasks and items based on their unpacked learning outcomes. Because of the differences in unpacking competencies between teachers and examiners, there is bound to be a significant volume of inconsistencies which result in assessing a number of learning outcomes that have NOT been taught, or teaching learning outcomes that will not be assessed. However, when student achievement is reported there is no reference to the mismatch but reports students’ ability as under achieving of learning outcomes. This is an invalid evidence of student learning therefore information is not useful for teaching intervention and other decision making.

**Diagram 1: Assessing – teaching mismatch**



**Inconsistent item valuing**

Second is the absence of a standard approach to be used by teachers and examiners in assigning marks to assessment items. Existing methods used at sixth and seven form level in the Pacific are based simply on the examiners personal teaching and assessment experiences. Some teachers and examiners do consult the Blooms taxonomy for establishing a mark value to an assessment item but again there is inconsistency in interpretation.

Lacking standard methods of assigning mark value to assessment questions results in assessment inconsistencies. A simple example of this inconsistency is identified in past exam papers. In the 2008 SPFSC economics examination which was out of 100 marks, a question reads “*Explain the concept of marginal utility*” and was assigned (3 marks). In 2011 the same question appeared in the examination out of 100 marks but was assigned (1 mark).

In the attempt to maintain standards in examinations across subjects or in a subject over years, a quality assurance process was developed. This process includes approving of schools internal assessment programmes; continuous training of examiners and moderators; moderation and checking of exam papers; standardising and scaling of marked responses. However, even with this quality assurance process in place, the reporting of students' achievement, at a detailed level that supported monitoring of learning, was difficult.

#### ***Absence in capacity for capturing, storing and processing detailed assessment data***

Third is the absence in IT capacity within the SPBEA. The existing software – ATLAS, was the main tool for administration, data processing and reporting of regional assessments. Although learning outcomes may be clearly presented within the prescription documents for the SPFSC subjects, there was no current link to those learning outcomes when student data is transferred from either examination scripts or internal assessment tasks to ATLAS. The student assessment record was captured as a total mark only.

The complexity and demand of the new approach makes the existing software incompatible. A massive amount of data and information needed to be captured, stored and processed. These included; (i) subject prescription specific learning outcomes to enable linking to student responses and achievements; (ii) assessment items; (iii) students' response level to every assessment item; (iv) achievement level descriptors for all specific learning outcomes as well as major learning outcomes; and all other student assessment and reporting related data. The processing of students performance and reporting achievement at a very detailed level requires high level programming which was not available within SPBEA.

#### ***Lack of a model that can produce outcomes-based reporting at specific levels***

Fourth is the absence of an outcomes-based model that reports student achievement at very detailed and specific levels. SPBEA had taken some measures in reporting student performance against a set of performance standards in the development of Standardised Tests of Achievement (STATs). However, this is in a slightly different dimension as it is more on generic competences in Literacy or Numeracy rather than in the achievement of broader based curriculum learning outcomes. (SPBEA Board Meeting paper, 2010)

Most if not all reporting of high stake examinations in the Pacific are based on aggregate totals. The SPBEA existing student reports are based on total assessment marks which are captured and stored in data processing software. Student achievements are then reported on grade levels ranging from E at the bottom to A+ at the top. Other systems capture and report students' assessment data at aggregated levels such as the NCEA standards in the New Zealand system which reports student's achievement of Standards. (NCEA, 2013)

#### ***Lack of understanding of, and resistance to, outcomes-based assessment and reporting***

Grading scale and marks reporting has been and is a rooted culture in the Pacific Islands. People grew up with this system and are comfortable with it as they understand it well. The outcomes-based concept was mooted in SPBEA more than 10 years ago, a paper presented to the SPBEA board in 2002 to introduce the outcomes-based system was unsuccessful as countries were not prepared.

Changing a culture is no small task. When you have invested your life's work in a process that is grounded in tradition and past practice, changing requires that we rethink our relationship to our colleagues, to our work, to our students and their parents. It is not an indictment of our past practices, but rather a realisation that the strategies that worked in the past are not effective in the world in which

we now live and learn, and that we need to move forward as a system to redefine our roles and the way we facilitate and support learning in a dynamic environment.

### **A new model**

The challenge in developing a new approach or model was to address the barriers to implementation of outcomes-based assessment discussed earlier. To ease the amount of work and time on teachers, especially manual record keeping for reporting and intervention purposes, an IT integrated approach was seen necessary. For the reporting of SPFSC student achievement at detailed levels of learning outcomes, a massive amount of data capturing, storing and processing is involved. The model was developed in the light of IT capability and an improvement in IT capacity.

The New Zealand NCEA system of reporting student achievement of learning outcomes (Achievement Standards) was seen appropriate for SPFSC. NCEA reports students' achievement at four levels namely, *Achievement with Excellence*, *Achievement with Merit*, *Achieved* and *Not Achieved*. However the NCEA system reports achievement only at an aggregate level and where the achievement levels are not described in specific detail.

In developing the new SPFSC approach, the first task was to decide on the number of achievement levels appropriate for reporting. The four levels of the New Zealand NCEA system were adopted but the criteria for achievement of these levels, a three band system; Band 1 – Basic skill, Band 2 – proficient skills and Band 3 – advanced skills was developed and well defined. Detailed descriptors of achievement levels specific to subject learning outcomes were also developed.

### ***Unpacking of prescription learning outcomes***

Unpacking of learning outcomes is seen as the core and most important building block for the assessment and reporting at detailed levels. To make the approach work, broad prescription learning outcomes needed to be unpacked so that the resulting learning outcomes are specific, clear and unique. This is to enable without difficulty the classifying of specific learning outcomes into the three skill bands. These specific learning outcomes must be clearly presented within revised prescriptions. In presenting the unpacked specific learning outcomes in the syllabi and prescription documents, all users will see and use the same learning outcomes. Teachers' classroom teaching and monitoring of student learning is aided, not only that learning outcomes are presented very specifically and clearly, but also the consistency in understanding and interpretation of learning outcomes amongst teachers and between teachers and examiners is maintained. Teacher focus will be based on these specified learning outcomes and examiners will develop assessment tasks and questions on the same specific learning outcomes. Learners too who use the prescriptions as a guide to studies also work on the same specific learning outcomes. The teaching/ learning – assessing mismatch is to a great extent alleviated.

It is understood that unpacking learning outcomes will result in so many specific learning outcomes. This is when technology is required for capturing and storing these huge amounts of information.

**Diagram 2: Prescription Broad Learning outcomes with unpacked specific learning outcomes**

<b>1.1</b>	<b>Explain the economic problem of scarcity and allocation using the production possibility model</b>
1.1.1	describe model as it is used in the study of economics
1.1.2	describe the purpose of a model in Economics
1.1.3	define a production possibility curve
1.1.4	explain the shape of production possibility curves
1.1.5	explain shifts in production possibility curves
1.1.6	list basic assumptions of a production possibility model
1.1.7	define the economic term scarcity
1.1.8	illustrate economic scarcity using the production possibility curve
1.1.9	illustrate choice using the production possibility curve
1.1.10	define the economic term opportunity cost
1.1.11	give an example of opportunity cost
1.1.12	illustrate opportunity cost using the production possibility curve
1.1.13	illustrate underutilization of resources using the production possibility curve
1.1.14	explain production efficiency
1.1.15	explain allocative efficiency

**Assigning of “Learning Outcomes Skill Score” and classifying learning outcomes**

Assigning skill scores to specific learning outcomes is considered crucial. It is equally important to present these skill scores in the prescription document to be available for users. The assigning of skill scores will enforce the identity and uniqueness of specific learning outcomes. This is essential for assessment as well as reporting purposes. This practice will enable teachers and examiners to simply identify the value of specific learning outcomes in terms of skill level embedded in the outcome. Monitoring of student learning through achievement of learning outcomes is valid when the skill score assigned to the learning outcomes is clearly identified and unchanged. Skill scores allows for ease of classifying specific learning outcomes. Refer to *Diagram 4*. In the modelled approach, learning outcomes are classified into three bands using a skill score grid developed from Bloom and SOLO taxonomy. **(Blooms: 2013)** *Diagram 3* depicts this.

Assigning of marks to test items is redundant with the introduction of skills bands. Criterion descriptors are used for marking student responses but instead of marks the response level is used. There are different levels of criterion descriptor (student response levels) in each of the three bands.

**Diagram 3: Skill score – Skill band Grid**

Blooms Taxonomy	SOLO Taxonomy	Skill Score	Skill Band	Description
Knowledge	Unilateral	1	1	<b>Basic Skills</b> Mastery of the knowledge and skills that are fundamental for proficient work.
Comprehension	Multilateral	2		
	Application	Relational	3	2
Synthesis, Analysis, Evaluation	Extended abstract response	4	3	<b>Advanced Skills</b> Presumes mastery of both the Basic and Proficient levels and represents superior academic performance.

**Diagram 4: Learning Outcomes skill score and skill band**

TOPIC	Major Learning Outcomes	Key Learning Outcomes	Specific Learning Outcomes (SLO)	SLO Skill Score	SLO Skill Band
Resource Allocation via the Market System	EcoA Demonstrate understanding of the key ideas about the operation of the market system, and analyse how decisions are made and their outcome in a modern market economy.	EcoA1.1 Explain the economic problem of scarcity and allocation using the production possibility model.	define model as it is used in study of economics	1	1
			describe the purpose of a model in economics	2	1
			define a production possibility curve	1	1
			explain the shape of production possibility curves	3	2
			explain shifts in production possibility curves	3	2
			list basic assumptions of a production possibility model	1	1
			define the economic term scarcity		1

**Design of Assessment item**

Diagram 5 below portrays an assessment blueprint, numbers of items/ questions are provided instead of marks. In this illustrated blueprint the examiner will design 22 items from Band 1 (Basic skill level) learning outcomes; 7 items from Band 2 (Proficient skill level) learning outcomes; and 3 items from Band 3 (Advanced skill level) learning outcomes. The question must be designed to reflect the skill level of the learning outcome from which it is designed.

**Diagram 5: Assessment Blueprint**

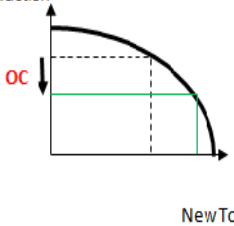
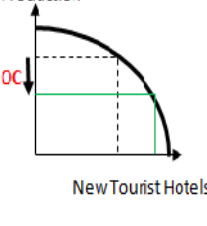
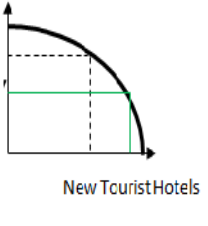
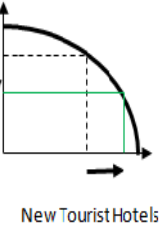
Major Learning Outcomes	Skill Level			Time
	Band 1 <i>Basic</i>	Band 2 <i>Proficient</i>	Band 3 <i>Advanced</i>	
EcoA: Demonstrate understanding of key ideas about the operation of the Market system, and analyse how decisions are made and their outcome in a modern market economy	22 items	7 items	3 items	80 min

**Design of Assessment Criteria**

The assessment criteria are more than just a simple rubric. They should provide model student responses at each of the response levels as demonstrated in Diagram 6 below. There must be no uncertainty between the response levels. The number of criteria for assessing responses to an examination item depends on the learning outcome band from which the item is designed. In band 1 there are two possible criteria - excellent response and weak response. In band 2, there are three criteria - excellent response, moderate response or weak response. In band 3, there are four criteria - excellent response, moderate response, low response and weak response. Student response to examination items will be assessed against these criteria. Because learning outcomes are defined by a band, consistency in valuing assessment items is guaranteed.



**Diagram 6: Assessment Criteria**

LO	SLO Skill Band	Evidence	Student Response Level			
			Excellent	Moderate	Low	Weak
EcA1.1	1	Scarcity is when resource a limited compared to the needs and wants	Scarcity is when resource a limited compared to human needs and wants <i>Idea is correct</i>			Increase needs decrease money <i>Incorrect idea</i>
EcA1.2	2	Agricultural Production 	Agricultural Production 	Agricultural Production  <i>No label</i>		Agricultural Production  <i>Incorrect illustration</i>

**Capturing of students record of performance**

In making judgements on students’ response, markers use the standard automated template presented in *Diagram 7* to record student performance. These record of performance sheets are then scanned by optical scanner to make the data available for processing and reporting of achievements. An electronic version is also available for markers who can complete students’ record of performance electronically.

**Diagram 7: Student response level capture sheet**

Specific learning outcomes	Skill Band	Student response level					
		Excellent response	Moderate response	Low response	Weak response	No response	Exceed
EcA1.1	1	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
EcA1.2	2	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
EcA1.3	1	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
EcA2.1	1	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
EcA2.2	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Reporting of student achievement of learning outcomes**

Capturing students’ record of performance at item level allows for reporting at detailed specific learning outcomes levels. This provides meaningful information about students learning as demonstrated by their response to assessed learning outcomes and reported by achievement levels. Teachers can refocus their teaching on weak areas identified from student performance. *Diagram 8* shows how a student’s achievement is reported at major learning outcomes level, similar reporting is done at specific learning outcomes level and overall subject level.

**Diagram 8: Student Major Learning Outcomes Reports**

Subject	Achievement Level Descriptor	Achievement Level	Assessment Type
Economics (7Eco)	<b>EcoA:</b> Show basic understanding by: defining, describing, identifying, distinguishing between terms, deriving/ drawing and writing simple explanations about the basic concepts and applications of market models in Economics; the concepts of demand, supply and market equilibrium; the role of firms in a market economy; and market structures applied to local case studies.	<b>ACHIEVED</b>	<b>External &amp; Internal</b>
	<b>EcoB:</b> Show comprehensive understanding by: fully explaining, analysing, demonstrating relationships, applying, interpreting and /or making predictions about market failure and government intervention in the economy; merit and demerit goods.	<b>EXCELLENCE</b>	<b>External &amp; Internal</b>
	<b>EcoC:</b> Show in-depth understanding by: explaining, applying, demonstrating relationships and analysing domestic and external economic activity; monetary and fiscal policy; aggregate supply and aggregate demand; applications of real world macro-economic data to economic theory and models.	<b>MERIT</b>	<b>External &amp; Internal</b>

### **Conclusion**

The work on outcomes-based assessment and reporting was successfully completed and trialled in 2013 with SPFSC. Students with an SPFSC qualification successfully registered into Universities in the Pacific including New Zealand and Australia.

This approach is more appropriate at classroom level for monitoring of student performance and for facilitating interventions. SPBEA should look into ways to roll this approach out to schools in its member countries.

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