

# WSC Academic Day 2016

Standardization for sustainability: the role of education

On the evaluation and the communication  
of data and decisions about sustainability

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Sustainability is a complex subject,  
imposing trade-offs and socially controversial decisions,  
based on concepts such as  
'parts per million', 'reliability of data',  
'statistical extrapolation', 'sensitivity of a model', ...

Our students are growing in a society where “all is relative” is common saying, backed up by philosophical positions such as “pure data is not available”, “the given acknowledged as taken”, “anything holds”, ...

Their implicit assumption is that outside the lab data and opinion are not really distinct

We have a problem of educating to scientific literacy

The critical issue in this context is:

how can sustainability be presented in rational terms?

Standardization can have a strategic role on this matter:

even if complete objectivity is not possible,

intersubjectivity is a reachable target,

as we know in terms of consensus

Consensus on scientific and technical topics  
should be based on data (as distinguished from opinions)

And if “pure” data is not available  
then there should be possible to reach agreements  
on the quality of “impure” data:

in order to properly deal with sustainability challenges  
our society requires public understanding and trust on data

An example:



“These notes define a common approach and calibrated language that can be used broadly for developing expert judgments and for evaluating and communicating the degree of certainty in findings of the assessment process.”

<https://www.ipcc.ch/pdf/supporting-material/uncertainty-guidance-note.pdf>

Scientific literacy requires indeed

(i) a “calibrated language” and

(ii) a “common approach”

for evaluating and communicating

the quality of data and decisions

This is a basic task of metrology,

“the science of measurement and its application”

Standardization is actively involved in this endeavor,  
in the Joint Committee for Guides in Metrology (JCGM):

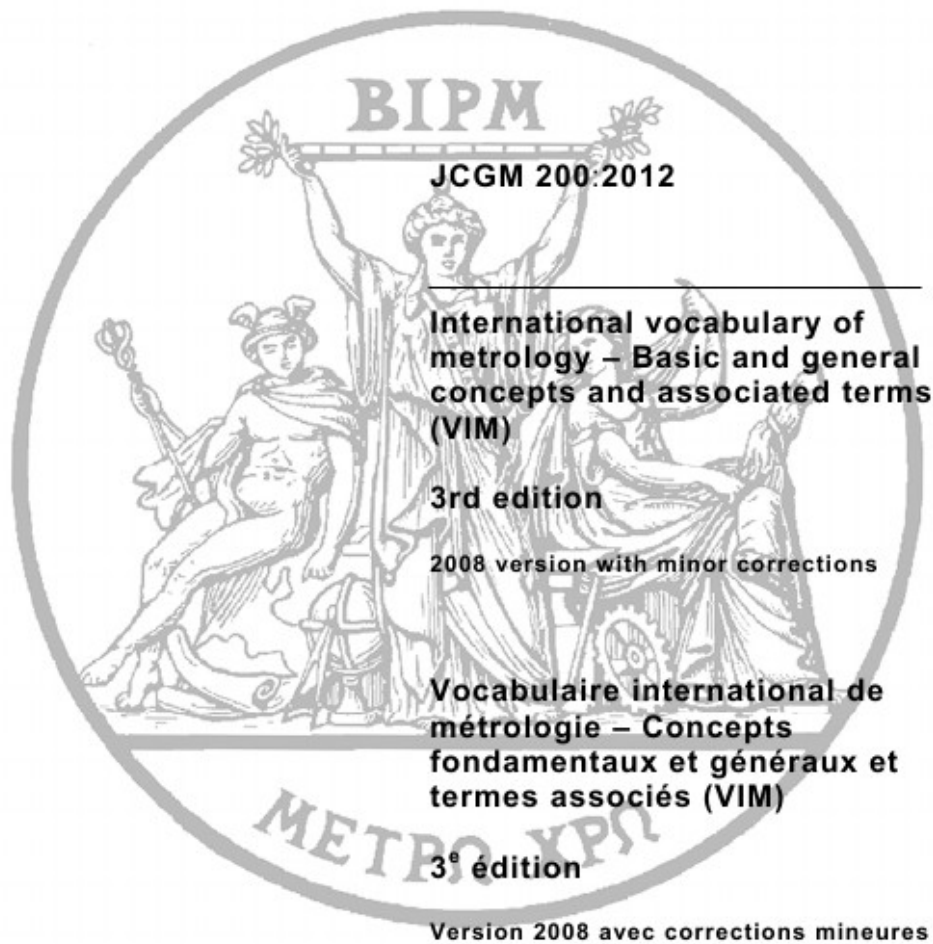
<http://www.bipm.org/en/committees/jc/jcgm>

an organization of “broadly-based international organizations working in the field of metrology”, including ISO and IEC,

aimed at the development of two documents addressing the general metrological needs of science and technology,

- the International Vocabulary of Metrology  
(the VIM: a “calibrated language”)
- the Guide to the Expression of Uncertainty in Measurement  
(the GUM: a “common approach” for evaluating and communicating the quality of data and decisions)





<http://www.bipm.org/en/publications/guides/#vim>

<http://www.bipm.org/en/publications/guides/#gum>

The VIM and the GUM are good resources in higher education

In our role of teachers we are called  
to make science and technology closer to our society,  
by teaching that a standard language and standard procedures  
to evaluate and communicate the reliability  
of our data, models, and decisions are possible

This is the fundamental purpose of the VIM and the GUM