Assessment and Policy Development of Sustainability in Higher Education with *AISHE*

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Biographic notes

From 1991, Niko Roorda, MSc, was a co-developer of a new study programme on Sustainable Technology. He was the head of this programme until 1998, when he started a project in the Brabant University of Vocational Education, called Project Cirrus, aiming at the implementation of sustainable development in more than 10 technical university programmes. This project, which has a pioneering and leading role in Dutch Higher Education, was granted the Dutch national award for Innovation and Sustainable Development in 2001.
From 2000 he has also worked on the development of the AISHE assessment tool. From 2002 he is working as a consultant for sustainability in Higher Education.
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Abstract

Following a request of the Dutch Committee on Sustainability in Higher Education (CDHO), an instrument has been developed, called *Auditing Instrument for Sustainability in Higher Education* (***AISHE***). Recently, the instrument has been completed. Practical tests have been done in a number of universities in the Netherlands and in Sweden.

AISHE can be applied as an instrument to assess the present situation in a (department of a) university, and as a tool enabling a representative delegation of the staff to envision a future situation in which sustainability has been integrated. In this way, an ***AISHE*** assessment can be used to strengthen the support for sustainability and to start or to improve a policy plan with respect to sustainability.

In the chapter, an overview is presented of the development project of the instrument, of the relations of it with quality management in general, and of the way to apply the instrument.

The second part of the chapter is a case study. One of the actual assessments will be described. Also, the effects of the assessment in the period after the assessment will be investigated.

Keywords

Accreditation, benchmarking, certification, criteria for sustainable higher education, external audit, internal assessment, quality management, visitation

1. The development of *AISHE*

1.1. The CDHO

The Dutch approach to the development of Sustainability in Higher Education (which from now, for short, will abbreviated to "SHE", for short) is a successful one.
As in many countries, there are a lot of initiatives in a number of universities. But that is not all: there is also a national committee, the "Committee on Sustainability in Higher Education" (CDHO). It started in 1998 as a rather informal collection of individual enthusiasts working in various universities, who sought a way to strengthen and help each other in their pioneering attempts to integrate sustainability in the educational programmes. In fact, it was students who took the initiative to form the CDHO.

Between 1998 and now, the CDHO has taken the lead in the development of SHE in the Netherlands. The committee is financed by the Dutch Government (the Ministry of Environment). Besides representatives of the major Dutch SHE projects, it consists of representatives of the Ministries of Environment, Education, Agriculture and Economical Affairs, and two rectors of universities.
The committee functions not only as a network organisation, but has also initiated a number of own activities. For instance, there is a national project called "disciplinary reviews sustainable development", which has produced a number of publications in which overviews are given of possible ways of implementing sustainability in individual university disciplines. Published so far are reviews on: *Management* (Jonker and Grollers, 2001); *Economics* (van den Bergh and Withagen, 2001); *Physics* (Bras-Klapwijk, 2001); *History* (van Zon, 2001); *Biology* (van Hengstum, 2001) and *Mathematics* (Alberts, 2001). Other disciplines will follow. Plans exist to have them translated in English, in co-operation with the Swedish MINT group (the Swedish equivalent of the CDHO).

Another action of the CDHO was the formation of a working group that had to develop a set of *criteria* for SHE. Soon, this working group decided that just the development of criteria was not enough: in order to operationalise these criteria, it was necessary to develop an assessment instrument. It is this instrument which would later be called ***AISHE***.
For this instrument, a number of basic decisions had to be made first.

1.2. Focus on education

Universities[1] can fulfil an important role with respect to sustainable development. In fact, they can do so in a number of ways, thus fulfilling several roles (see also: Clugston & Calder, 2000):

- The university as a research institute;
- The university as a centre of expertise for enterprises;
- The university as an organisation in itself;
- The university as an institution for higher education;
- The university as a part of society in general.

As a research institute, a university is not really very different from other research institutes, for instance the ones linked to major industrial companies. Here, the university's contribution will probably exist of research in specific fields, e.g. environmental studies, sustainable economics, technology, sociology, agriculture, etcetera.

As a centre of expertise for enterprises, the university can assist companies, large ones as well as SME's, in projects related to sustainable development, either or not as commercial projects. The university can train the staff, it can accompany product development projects, or it can assist the company in developing sustainable elements in the company policy.

As an organisation in itself, the importance of a university is comparable to lots of other organisations. The major contribution in this respect lies in the environmental management and everything that is related to this. So-called "Greening the Campus" projects focus on these subjects. (See for instance Herremans & Allwright, 2000.)

As an institution of higher education, it is the task for the university to educate the students in such a way that afterwards, as professionals, they will think and act in a way that contributes to, or at least doesn't interfere with

[1] Wherever the term "University is used, it also refers to other institutions of Higher Education, e.g. the German Hochschule and the Dutch Hogeschool, unless explicitly stated differently

sustainable development. This can be realised in a lot of ways, for instance through special courses in sustainability subjects, or through integration of sustainability in the curricula of the courses.

Lastly, as a part of society, the university is an actor in all kinds of societal processes. It can participate in public discussions about the future through the media, it can assist primary or secondary schools in developing elements of sustainability in their education, or it can join in Local Agenda 21 projects, thus promoting the public awareness of the need for sustainable development. (See for instance Megerle & Megerle, 1999.)

Of these various roles, probably the education role is the most important one. This is because educating students in a sustainable way will have a snowball effect. If, for a number of years, a lot of students graduate from a university where they have acquired an attitude in which sustainable development is considered as important and where they have acquired knowledge and skills to express this attitude in their professional behaviour, the result will be that a flood of "ambassadors of sustainability" will function in a lot of companies.
In other words: If the university itself behaves in a sustainable way, it means that *one* organisation acts sustainable. If the university educates the students in a sustainable way, in time *many* organisations will act sustainable.

Of course, the different roles influence each other. Results of research in sustainable subjects and of commercial projects will have a spin-off towards education. Also, with an environmentally sound organisation management, the university will play a role model for the students. So, all different roles will contribute to the snowball effect.

This is why AISHE aims at the educational role in the first place. The other roles are not completely absent, because of their contributions to education; but the education is the focus of the assessment instrument.

1.3. Three other fundamental choices

In the discussions of the Working Group on Criteria for SHE, three separate dimensions appeared to be relevant, each leading to a fundamental decision about the nature of the criteria-to-be:

- *Content* oriented versus *process* oriented
- *Quantitative* versus *qualitative*
- *Prescriptive* versus *descriptive*

In more detail, this lead to the following considerations and decisions:

Dimension 1: Content oriented versus process oriented criteria

Content oriented criteria are about the concrete selection of subjects that should or should not be part of certain curricula, from a sustainable perspective, and about guidelines for the organisation management.
Process oriented criteria give information about the way in which the curricula are to be designed, and about the way in which decisions are made concerning the organisation management. These are criteria on a meta level.

Examples

Dimension 1	Content oriented	Process oriented
Curriculum	Photovoltaic cells are a part of the curriculum.	Decisions about sustainable subjects in the curriculum are made explicit.
Vision	The use of hen batteries is not compatible with sustainable development.	The organisation has a vision on ethical questions that are relevant for the own professional fields. This vision is updated regularly.
Staff development	Engineering teachers receive supplementary schooling in environment oriented product development.	There is a policy and a budget for staff development in sustainable development.

Considerations

The advantage of content oriented criteria is, they offer clarity: clarity about the product that is to be delivered (i.e. the educational content) and about the process (curriculum development, staff development).
At the same time, this clarity is a disadvantage, for various reasons:

X They are absolute: they don't leave space for the own responsibility of an individual educational institute (or a part of it);
X Fundamentally, they are not generally acceptable: they mirror the subjective opinion of the designer of the criterion, and so they carry the risk that others don't agree with them. If so, at best a never-ending yes-no-discussion could rise;
X They are time related and statical: they have a risk of getting obsolete because of new developments. When for instance a new technical invention would be made which would make photovoltaic cells technically obsolete, at the same time the criterion would be obsolete.

Although process oriented criteria carry the risk of vagueness, this doesn't really have to be a serious disadvantage. For instance, the above mentioned criterion about a vision on ethics entails that educational organisations in which animal welfare is a relevant subject, will not be allowed to deny taking position about hen batteries.

Choice
Actually, the point about adopting process-oriented criteria is that, if the processes are formulated carefully and are executed carefully as well, it may be expected that the resulting contents will be ok too.
On the basis of this point, in the AISHE method the process-oriented principle has been chosen.

Dimension 2: Quantitative versus qualitative criteria
Criteria can either be formulated as quantitative measuring data, or in a less precise, more describing, qualitative way.
In the British "Higher Education 21" programme ("HE21") a large amount of quantitative indicators has been designed. Some examples are shown in the table below, in the column "quantitative".

Examples

Dimension 2	quantitative	qualitative
Curriculum	percentage of students participating in modules that are related to sustainability	The relation between sustainability aspects in the professional qualifications and the curriculum has been formulated explicitly
External effect	number of sustainability related conferences, organised in the current year	The organisation contributes actively to enlargement of knowledge and insight about sustainable development in society and to the public opinion
Internal environmental management	CO_2 emission per FTE[2] per annum	Annually an environmental report is published.

Considerations
Using quantitative criteria can only be meaningful, if the indicated quantities can be defined and measured in an exact way, and if there is an objective method to agree upon limits for them.
This is a problematic point of all above-mentioned quantitative examples.
X The mentioned percentage of students, for example, can only be measured if it is possible to determine for each module if it is related to sustainability. But, how can this be determined? According to some people, nuclear energy is essential for a sustainable system of energy, while others combat this opinion; does a module on nuclear energy count for the above percentage?
X How does one determine whether a certain conference is sustainability related? Is, let's say, a conference on waste processing sustainability related?
X For which kinds of CO_2 emission will the educational institute be held accountable, and which will not? And, exactly how will the measurements be done to establish the numbers?

On top of all this, for all the above examples the decision of choosing a limit value is subjective and normative, and so each measured quantity will always be questionable.

[2] FTE = Full Time Equivalent, full time employment position

In other words, the disadvantage of quantitative criteria is that they suggest a fictitious level of exactness that in reality cannot be made true.

The "right" percentage of credits

A characteristic example of this fictitious exactness is the (in some places) ongoing discussion about the "right" percentage of the curriculum that should be dedicated to sustainable development (expressed in a percentage of the credit points). According to some this should be 5%; others claim the optimal value should be higher or lower. In fact every concrete percentage is fundamentally wrong. In the first place because of the fictitiousness of the exactness: does a module handling, say, environmental law, fall within this percentage of sustainable curriculum parts? And what about the earlier mentioned module on nuclear energy?

In the second place, quite a few modules have nothing or hardly anything to do with sustainability when viewed on their own, but are very relevant for sustainability when viewed in a larger framework. A characteristic example is a module in a mechanical engineering programme dealing with connection technologies (gluing, screwing, welding, clamping, etc.): on their own, these techniques are not clearly more or less sustainable. But when a product consisting of several components is to be designed, subjects will appear like *design for disassembly* and *reuse and recycling*, which are very relevant for sustainability; and a thorough knowledge of connection technologies contributes to a good designing process. Such a module doesn't belong in a direct sense to the percentage of sustainable curriculum parts, but it certainly does in an indirect way.

Choice

Many aspects of the level to which sustainability has been integrated in education and in the organisation have fundamentally no exact nature. This does *not* imply that they cannot be measured; but usually they have to be expressed on an ordinal scale, instead of a quantitative interval scale.

Therefore, with respect to the ***AISHE*** method a qualitative approach has been adopted, and the results are expressed on ordinal scales.

Dimension 3: Prescriptive versus descriptive criteria

Criteria can be designed as obligatory prescriptions, as is usual with many of the customary instruments for quality and environmental management. In the table below, in the left column a number of examples are shown, derived from ISO 14001, EMAS and BS7750.

The alternative is a descriptive character. This may take the form of an ascending progression of descriptions, together constituting an ordinal scale; an organisation can compare itself with this scale and determine which organisation development stage it is in.

A good example of this is the EFQM method: for a series of criteria five "stages" are discerned. The table below shows some examples in the right column (see: HBO Expert Group, 1999).

Examples

Dimension 3	prescriptive	descriptive
Staff Development	The organisation shall (…) require that all personnel whose work may create a significant impact upon the environment, have received appropriate training. *(ISO 14001: 4.4.2)*	***Stage 1:*** Staff counselling, training and development are dependent on individual initiatives. *(EFQM-HE: 3.5)*
Policy	The company environmental policy shall be adopted and periodically reviewed. *(EMAS: appendix 1, A.2)*	***stage 3:*** The policy is evaluated on the basis of a systematic analysis (...). *(EFQM-HE: 2.4)*
Communication	The organisation shall establish and maintain procedures for receiving (…) communications (internal and external) from relevant interested parties. *(BS7750: 4.4.1)*	***stage 4:*** Interested parties are actively involved in discussions about policy development and implementation. *(EFQM-HE: 2.3)*

Considerations

The use of prescriptive criteria has several disadvantages.

A main problem is that the prescription of criteria is *normative*. True enough, the actual designing of sustainable education is fundamentally normative, because the goals and the contents are strongly related with the personal

views of those who are responsible for the study programmes, and depend on their ethical norms. But exactly because of this, it is impossible to construct a measuring instrument based on normative prescriptions and then receive a general acceptation.
Besides, imposing external obligatory criteria would contradict one of the most important cornerstones of sustainable development: the own individual responsibility of each person and institution involved in the process of sustainable development.

Another point: Only a few universities have appeared to be able to meet high standards: for instance, in Europe there aren't many universities possessing an ISO certificate. This is a serious disadvantage of obligatory prescriptions: if they can hardly be met, they don't stimulate to try to reach them. And the only alternative - lowering the limit - doesn't sound attractive because this means compromising on beforehand.

A final argument is that it isn't always evident that an educational organisation will have to strive for the highest quality demands in all respects: the maximum isn't always the optimum. An organisation may decide deliberately to aim at lower stages for certain aspects, on the basis of internal or external reasons. If a measuring instrument would be based on on-off prescriptions, an organisation doing so would automatically disqualify itself.

Choice
Criteria for sustainable education should place the responsibility for choosing goals and limits with those take care of designing and implementing education, i.e. with individual organisations (universities or parts of universities).
Besides, criteria should be practically applicable and contribute to the organisation policy.
For these reasons, AISHE is decided to consist of descriptive criteria, enabling the formulation of auditing results in more than two possible values.

1.4. The assessment instrument

Criteria should be practically applicable, and so the Working Group decided to develop an assessment instrument based on the list of criteria.
The logical next question was: for *whom* should this instrument be developed? Why would a SHE assessment instrument be interesting, and for which parties?
There are two kinds of stakeholders, it was concluded. In the first place there are the **universities** themselves, which could use such an instrument for several reasons:

- To assess the present situation within the university or within a part of it (e.g. a faculty or a separate study programme) with respect to SHE
- To design elements of a desired future situation, perhaps even leading to a structured policy plan regarding SHE
- To get staff members and managers involved in a process of developing SHE, and to join forces within the organisation
- And later: to have repeated assessments, in order to be able to evaluate the SHE policy of a former period.

In the second place, a whole range of external institutions and people could benefit from a SHE assessment tool. For instance:

- For external audits, related to a larger (for instance national) quality management programme, related to visitations and/or accreditation
- For decisions by external sponsors about financing projects etc.
- For potential students, to help them select the best university.

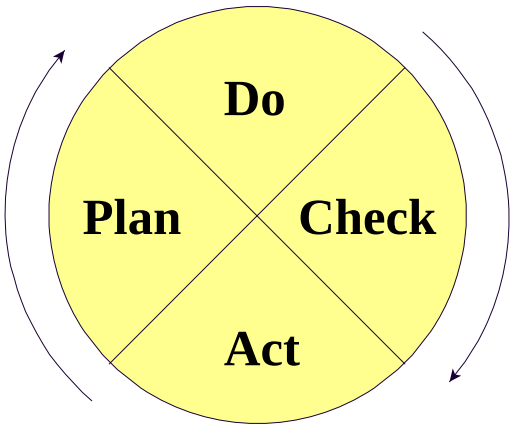
This lead to a number of restrictions about the instrument that was to be developed.

1. Since it was to be *process oriented*, it should be about the quality of these processes. So, there had to be a direct relation with the general quality management.
2. It should enable internal assessments as well as external audits.
3. It should be able to apply it in the process of visitations and accreditation.
4. Since it should enable potential students to select their university, it should be applicable for *benchmarking* and *ranking*.
5. In order to raise the involvement of the staff and the management, it should get quite a lot of those people involved in the assessment process.
6. Because of the qualitative character, it should make use of *ordinal* scales instead of e.g. ratio scales.

7. And since it should be descriptive and not prescriptive, it should offer the assessors a range of possible descriptions with which the own organisation could be compared.

Because of the desired relation with the general quality management, it was a natural step to look at existing instruments for quality management, and to see if it was possible to adopt such an instrument and adapt it for SHE.
We were able to find such an instrument, which met all our needs remarkably well.

The European Foundation for Quality Management had developed a model for quality management, named EFQM after this organisation. As a basis, they took the Quality Circle of Deming: to the parts "Plan", "Do" and "Check" were attached a number of criteria concerning the quality management in a company.
The Dutch organisation for quality management, INK, enhanced the EFQM model by attaching to each of the EFQM criteria an ordinal scale of five stages. Each stage is a verbal description of a possible state the assessed company is in, with respect to this criterion. (See: INK, 2000.)
Starting with this EFQM-INK-model, a group of Dutch universities for Vocational Education ("Hogescholen") made an adapted version for Higher Education (which may be called the EFQM-HE-model, see: HBO Expert Group, 1999).
It is this EFQM-HE-model which has been taken as the basis for AISHE.



1.5. *AISHE* : stages and criteria

A general description of the five stages which together form an ordinal scale, is shown in the table below:

General description of the 5 stages				
Stage 1: **Activity** oriented	*Stage* 2: **Process** oriented	*Stage* 3: **System** oriented	*Stage* 4: **Chain** oriented	*Stage* 5: **Society** oriented
- Educational goals are subject oriented. - The processes are based on actions of individual members of the staff. Decisions are usually made ad hoc.	- Educational goals are related to the educational process as a whole. - Decisions are made by groups of professionals.	- The goals are student oriented instead of teacher oriented. - There is an organisation policy related to (middle)long-term goals. - Goals are formulated explicitly, are measured and evaluated. There is feedback from the results.	- The educational process is seen as part of a chain. - There is a network of contacts with secondary education and with the companies in which the graduates will find their jobs. - The curriculum is based on formulated qualifications of professionals.	- There is a long-term strategy. The policy is aiming at constant improvement. - Contacts are maintained, not only with direct customers but also with other stakeholders. - The organisation fulfils a prominent role in society.

Although the general description of these stages in ***AISHE*** matches those of the EFQM-HE-model, the criteria themselves certainly do not. They are the ones that are used as a description of what sustainability in higher education is all about.
The list is shown below:

***AISHE* : The criteria list**	
== Plan ==	**1. Vision and policy** 1.1. Vision 1.2. Policy 1.3. Communication 1.4. Internal environmental management **2. Expertise** 2.1. Network 2.2. Expert group 2.3. Staff development plan 2.4. Research and external services
== Do ==	**3. Educational goals and methodology** 3.1. Profile of the graduate 3.2. Educational methodology 3.3. Role of the teacher 3.4. Student examination **4. Education contents** 4.1. Curriculum 4.2. Integrated Problem Handling 4.3. Traineeships, graduation 4.4. Speciality
== Check ==	**5. Result assessment** 5.1. Staff 5.2. Students 5.3. Professional field 5.4. Society

As an illustration of all this, criterion 2.3 (staff development plan) is shown in detail, with all five stage descriptions:

Criterion 2.3: **Staff development plan**				
Stage 1: **Activity** oriented	*Stage* 2: **Process** oriented	*Stage* 3: **System** oriented	*Stage* 4: **Chain** oriented	*Stage* 5: **Society** oriented
- Staff development in sustainability depends on individual initiatives.	- There is a staff development plan in sustainability. - This plan is mainly short term related. - For the execution of the plan, facilities are made available by the management.	- The need of the organisation for expertise in sustainability is known. - The development plan is based on a match between this need and the individual wishes of the staff members for supplementary training and refresher courses. - The plan is mainly middle long-term related.	- The sustainability staff development plan is long term related. - It includes a policy towards appointments and resignations, retraining, introduction of new staff members. - An explicit relation exists with the strategic policy of the organisation in general.	- The organisation policy on sustainability is based on societal and technological developments. - There is a systematic feedback to society.

During 2000 and 2001, the list of criteria was designed and discussed with a lot of stakeholders from within and outside of education. (The details of this development have been published, for instance in Roorda, 2000), and for each of the criteria the five stages were designed.
In the second half of 2001, the development was completed with a series of practical tests in universities in Sweden and the Netherlands. The procedure of these tests, as well as the detailed results of one of these, will be described in the next part.

2. A case: Hogeschool Himbreeg

2.1. The assessment procedure

In short, the procedure for an assessment is as follows (if a minimum scenario is followed):

The steps of an *AISHE* assessment (minimum approach)

- Preparation with the internal assessment leader:
  - Explanation of the method
  - Discussion of the procedure
  - Selection of criteria and appendices to be treated
  - Composition of the group of participants
- Written information to the participants
- Introduction with the group of participants:
  - Explanation of the ***AISHE*** method
  - Discussion of the procedure
- Filling in the criteria list: by the participants individually
- Consensus meeting, participants + consultant
- Review with internal assessment leader

Some of these steps will be explained in some more detail.

Group of participants
In small organisations (up to about 15 staff members) each staff member can participate. In larger organisations a group of 10 to 15 participants is selected. The group has to be representative for the complete teams of the staff members and the students, so there have to be one or more managers, a number of teachers (professors, lecturers, etc.) coming from a wide variety of disciplines and curriculum parts, some students, and perhaps one or more members of the non-teaching staff.

Filling in the criteria list (individually)
After the model has been explained to all participants, they are asked to read the part of the ***AISHE*** book that contains the descriptions of the five stages for all criteria. While doing this, individually, they compare this to their own organisation (e.g. an education programme or a faculty of their university), and find the stage which resembles their own situation most.
At the end, they write their conclusions down on a form and hand it to the assessment leader, who combines the conclusions of all on one composite form.

Consensus meeting
Next, a meeting takes place in which all of the participants are present. At the beginning (or earlier) the copied composite form is distributed.
As before, every participant has the ***AISHE*** book, in which the own scores and annotations are written: these are essential for the meeting.
All participants have an equal weight in the discussions, in the proceeding of the conversation and in the decision making.

Each (selected) criterion is discussed. On a basis of intrinsic reasoning, a common conclusion is looked for about the right score of the organisation.
If possible, decisions are made based on consensus. If, however, for some criterion no consensus can be reached, the chair will conclude that, of all proposed scores, the *lowest* is the one that is decided upon: this is, because a (higher) score has only definitively been realised if all participants agree with it.
In *no* case at all, decisions are made by voting.

Desired situation, priorities, policy
During the discussion of the criteria, naturally a number of possible improvement points will rise. This will enable the group to formulate – for each criterion – a *desired* situation. This desired situation is defined, not only in the form of a stage to be reached, but also in the form of a series of concrete targets and associated activities that will lead to the desired stage.
In order to guarantee that the necessary concreteness is really achieved, at the beginning of the consensus meeting a decision is made about the (future) policy period the desired situation is related to. This may for instance be a period of one year, starting at the moment of the assessment.

When for all 20 criteria, or for a major part of them, policy intentions are defined in this way, a large list of goals and activities will be formed on which work can be done in the coming period. But then of course the danger is that if this list is rather huge, in reality probably many of them will not have much of a chance: it's a well-known fact that a policy plan with more than 3 to 5 priorities usually has not much chance of success.
This is why the meeting ends with the assignation of those elements in the list of policy ideas that the group judges are most important: those elements receive highest priority.

The result
- A description of the *present* situation, in the form of a number (the stage) for each criterion plus a description for each criterion in words;
- A ditto description of the *desired* situation;
- A *date* on which this desired situation has to be reached;
- A list of first priorities, that are considered to be crucial in order to be permitted to conclude that the policy will have been successful.

In the end, this package has the status of "recommendations to the management".
This set of recommendations has a good chance of being accepted by the management and to become a part of a concrete policy plan. This is because the management itself is represented in the group of participants (and that is exactly why that is so vital!); and the recommendations have – if all went well – been chosen in consensus by a representative group from the staff and the students, so it is likely that there is support for the conclusions.

For an assessment in which all 20 criteria are investigated, the consensus meeting(s) will probably take 4 to 6 hours.

2.2. The results of the Hogeschool Himbreeg
One of the universities where the assessment has been done, in order to test the instrument, was the Hogeschool Himbreeg (Netherlands; in fact the name "Himbreeg" is fictitious, in order to anonymise the results), a university for professional education. Tested was the study programme "Food Science and Technology". (In fact, the assessment was done twice, see later.)

The results of the assessment are:

=== *PLAN* ===

1. Vision and policy

Criterion 1.1. Vision
Present situation: Stage 1
The Protocol on Sustainable Education has been signed for the university as a whole. There are good intentions, but there is no thoroughly developed vision.
Desired situation: Stage 2 - ***High Priority***
Explicit vision, put down in documents.

Criterion 1.2. Policy

Present situation: Stage 1

There is a start.

Desired situation: Stage 2 - ***High Priority***

Not wanting to run too fast, so no translation in measurable goals.

Criterion 1.3. Communication

Present situation: Stage 1

Probably, not everybody knows that the Protocol has been signed: perhaps about 30% of the university staff have the information. In our own department, this percentage may be higher.

Individually, staff members have contacts with each other on sustainability. Unofficial discussions.

Desired situation: Stage 3 - ***High Priority***

The Protocol is better known.

The ***AISHE*** assessment contributes to the discussions. Concrete targets are to be made about the integration of sustainability in education: formulate a sustainability project, as an item for the project manager of curriculum development.

Criterion 1.4. Internal environmental management

Present situation: Stage 1

The laws and regulations on chemical waste are implemented. Waste is separated. The catering uses "environment cups".

Desired situation: Stage 2

An environmental coordinator is absolutely necessary, as well as a policy plan on operations and environment. Not on the level of this department but on the level of the whole university.

2. Expertise

Criterion 2.1. Network

Present situation: Stage 1

There are working relations with P., A. and E. This is on the level of individual staff members.

Desired situation: Stage 2

Involve the Professional Field Committee, enlarge it if necessary. Link it's work to the policy on traineeships. Report about it regularly in meetings and in the processes of curriculum development.

Criterion 2.2. Expert group

Present situation: Stage 1

Some staff members involve some aspects of sustainability in curriculum development. E.g. in the subject on ethics.

Desired situation: Stage 2

In order to realize an expertise center on sustainability, a lot of time will have to be made available. A development plan will be made in order to acquire the necessary expertise.

Criterion 2.3. Staff development plan

Present situation: Stage 1

A small number of staff members have a fair or even a thorough knowledge on sustainability. Most people don't know this of each other.

On the subject of chain management, last year a project has been done on the enlargement of the knowledge of the staff. This is sort of a policy, but up till now only incidentally.

Desired situation: Stage 3 - ***High Priority***

A systematic approach will be developed on staff education with respect to sustainability, based on the integral vision on sustainability that will be developed (see 1.1).

All staff members know quite exactly which knowledge is present with their colleagues. All have good knowledge and insight within their own field of work. This is true for all specialties of the study program.

Criterion 2.4. Research and external services

Present situation: Stage 0

There are no commercial projects in which sustainability is an element.

Desired situation: Stage 0

There are no plans to change this situation.

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=== *DO* ===

3. Education goals

Criterion 3.1. Profile of the graduate

Present situation: Stage 1

The educational goals contain some environmental issues, like "Handle with care..."

Desired situation: Stage 2

The present educational goals will be investigated in correspondence with curriculum development, and improved wherever possible with respect to sustainability.

Criterion 3.2. Educational methodology

Present situation: Stage 2

The new curriculum has been designed in such a way that individual responsibility is trained (stage 3): e.g. propaedeutical projects. In practice this has not yet been realized in all parts. Students are members of the Education Committee.

Desired situation: Stage 4 - ***High Priority***

Make visible, in what way the own choices and decisions of the students are related to the professional practices. Differences in graduation profiles and in the starting profiles of individual students are to be made clear. The way to do this: portfolios, coaching of individual students. Plus: solve practical problems, e.g. timetables in relation with individual learning routes.

Criterion 3.3. Role of the teacher

Present situation: Stage 1

Some individual teachers give attention to this. The organization doesn't propagate it strongly.

Desired situation: Stage 1

The organization will advocate sustainable behavior of the staff. Wherever possible, all teachers will do the same. Feedback will be given, e.g. by making sustainability an item on the agenda of staff appraisals. Al least four times a year, sustainable behavior will be an item in the discussion groups.

Criterion 3.4. Student examination

Present situation: Stage 1

Within a few months the student activities in the "thematic weeks on sustainability" will be assessed. The same is true for the global LCA.

Desired situation: Stage 2

While formulating the educational goals with respect to sustainability, a systematic assessment of the student achievements will be developed in relation with it.

4. Education contents

Criterion 4.1. Curriculum

Present situation: Stage 2

The first year contains a module of 80 hours (2 credit points) on basic knowledge on sustainability (the "thematic weeks on sustainability"), which are obligatory for all students.
The second year contains an 80 hours (3 ects-credits) module. Elements are present like: environmental law, global LCA's, environmental management systems as a part of quality management.
In one of the graduation profiles, chain management is treated.

Desired situation: Stage 3

The results of the module are intertwined with the rest of the curriculum.
For the rest of the curriculum, investigation is necessary and will be done.

Criterion 4.2. Integrated Problem Handling

Present situation: Stage 2

Propaedeutical projects and 2nd year projects are done, 1 theme per period, each with an integrating approach.

Desired situation: Stage 3

First improve what we have, before starting new things.

Criterion 4.3. Traineeships, graduation

Present situation: Stage 1

Some traineeships contain elements of sustainability, e.g. environmental management systems. Not many chain related subjects.

Desired situation: Stage 2

Sustainability will be inserted in an existing checklist of obligatory points of attention for traineeships and graduation projects.

Criterion 4.4. Speciality

Present situation: Stage 1

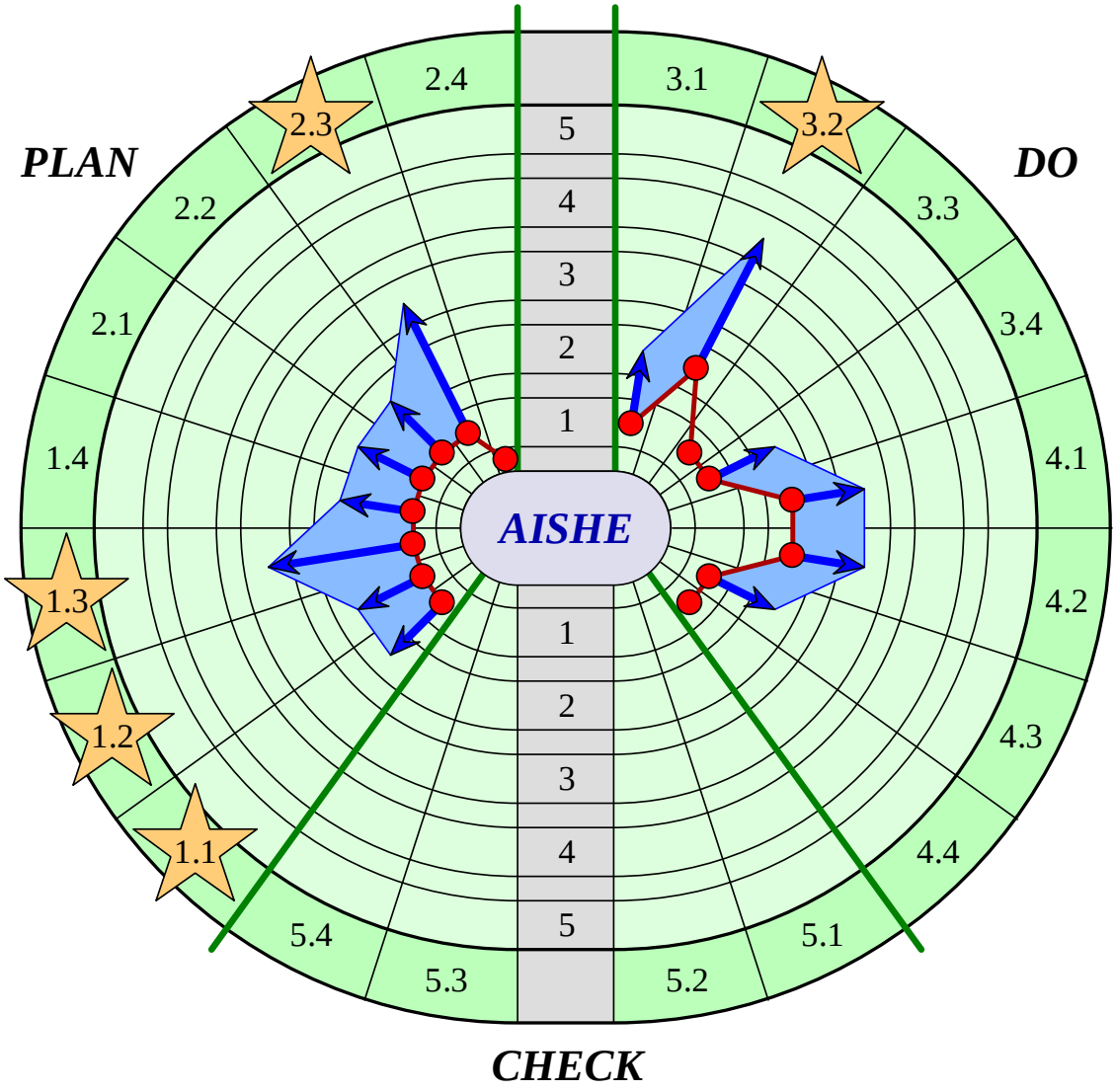
The possibility of choosing a minor sustainability specialism exists.

Desired situation: Stage 1

There is no wish to enlarge the possibilities in this way.

(The third part, "Result assessment", was not investigated.)

These results can be presented in a graphical way, like this:



2.3. Global indicators

On the basis of the results of the assessment, some indicators can be calculated which give a global view of the situation. They are:

Median:

One could be tempted to calculate the *mean* stage, in order to get an indication about the situation in general. Unfortunately this is not allowed: the stages belong to ordinal scales, and so they can't be averaged.
Instead, the *median* can be used. This is to be found as the middle value of all scored stages, after they have been put in an ascending order.

PLAN DO Balance:

The *Plan Do* balance is the difference between the sum of the *DO*-scores and the sum of the *PLAN*-scores.

If this balance is less than zero, relatively much attention is given to the preparation ("*PLAN*"), which is not yet implemented in education in an equal proportion ("*DO*").
If the balance is greater than zero, the education has been made sustainable in a relatively strong amount, but this is not very well anchored in the organisation.
This indicator should be used with great care! Here too it is true: the stages form ordinal scales, and so it is not allowed to add or subtract them. Because of this, the result can only be interpreted as a very rough and global indicator. A difference between a Plan Do balance of e.g. 2.5 and one of 3 cannot be interpreted as significant.[3]

Policy ambition:
= the sum of all differences between the desired and the present stages.
The same cautiousness goes for this indicator: a difference between an ambition of e.g. 6 and one of 7 is not significant. But since practical tests have shown that there exist remarkable differences (policy ambitions varying between 6 and 24), the policy ambition is nevertheless an interesting quantity.

Distance to protocol:
= the total number of stage steps to take, necessary to meet the demands of a certain protocol.
At the moment of publication of this book the only protocols that exist are the ones belonging to the Certificate for Sustainable Higher Education, designed for the Dutch Higher Vocational Education.

The results for these global indicators for the Hogeschool Himbreeg will be shown in the next part.

2.4. Reliability of *AISHE* : Equivalence between groups

The ***AISHE*** developing group was lucky to have the opportunity to do the assessment twice in the same situation. The Hogeschool Himbreeg kindly offered two groups of participants to do the assessment with. Theoretically, the two groups were 100% equal, each consisting of the same amount of managers, teachers and students of the same study programme.
This enabled the investigators to test the equivalence between groups, an important aspect of the reliability of the method.
The results, when compared, are remarkably equivalent:

[3] Objections from a theoretical standpoint can be made against such an indicator. But, if used in a cautious way, it is possible to draw some conclusions from it. Some strong precedents exist. The Eco-indicator, for instance, is in the same way an aggregate quantity, in which variables of an incomparable magnitude are added together through the use of weight factors. One could say: in the Plan Do balance, to all AISHE criteria a weight factor of 1 is given.

University Department		Himbreeg - Food Science & Techn. - Group 1			Himbreeg – Food Science & techn. - Group 2			Difference (group 2 - group 1)		
Criterion	**No.**	**Present situation**	**Desired situation**	**Priority**	**Present situation**	**Desired situation**	**Priority**	**Present situation**	**Desired situation**	**Priority**
Vision	1.1.	1	2	1	1	3	1		1	0
Policy	1.2.	1	2	1	1	3	1		1	0
Communication	1.3.	1	3	1	1	2	1		-1	0
Internal environmental managem.	1.4.	1	2		1.5	3		0.5	1	
Network	2.1.	1	2		1	2				
Expert group	2.2.	1	2		1	2				
Staff development plan	2.3.	1	3	1	1	2.5			-0.5	-1
Research and external services	2.4.	0	0		0	1			1	
Profile of the graduate	3.1.	1	2		1.5	3		0.5	1	
Educational methodology	3.2.	2	4	1	2	3			-1	-1
Role of the teacher	3.3.	1	1		1	2			1	
Student examination	3.4.	1	2		1	1			-1	
Curriculum	4.1.	1.5	2.5		1.5	2.5				
Integrated Problem Handling	4.2.	2	3		3	3		1		
Traineeships, graduation	4.3.	1	2		1	2				
Speciality	4.4.	1	1		1	1				
Global indicators:										
Median	*Med*	1	2		1	2.25			0.25	
Plan Do balance	*PDB*	3.5	1.5		4.5	-1		1	-2.5	
Policy ambition	*PoA*		16			16.5			0.5	
Distance to Protocol 2000	*D00*	3	0		2	0		-1		
Distance to Protocol 2002	*D02*	7	0.5		6	0		-1	-0.5	

This proves that ***AISHE*** rendered (at least in this case) a very reliable result. Most of the "present" scores are identical: only 3 out of 16 scores differ. The "desired" scores show more difference, but that is no surprise, since this is not a measurement but the result of a group discussion about possible future developments. Nevertheless, the total policy ambition in both groups is almost equal (16 vs. 16.5). Perhaps this value in some way reflects the organisation culture.
The resemblance between the two group results is all the more remarkable, because there appeared to be a noticeable difference in the atmosphere during the consensus meeting: members of one group were rather "pro" sustainability, while some of the members of the other group showed some more scepticism.
Also, most of the priorities are the same in both groups. It is interesting that most of them are in the "Plan" part. This is related – as both groups explained – to the fact that the Plan-Do-Balance is not in equilibrium. According to both groups, the "Plan" part is low, compared with the "Do" part, indicating that the management and the staff of the study programme are doing quite well in the education itself, but is underestimating the importance of anchoring the sustainability achievements in the vision and the policy.
In order to appreciate these values better, it is interesting to compare them with those of other universities.

2.5. Comparison with other universities

So, where does the Food Science & Technology Program of the Hogeschool Himbreeg stand, when compared to other universities?
The table below, containing the results of some Swedish and Dutch universities, shows it. It appears that Himbreeg, though not the best of the investigated universities, is doing no less than the others.

	Himbreeg – FST group 1			University 2			University 3			University 4		
No.	**Present situation**	**Desired situation**	**Priority**	**Present situation**	**Desired situation**	**Priority**	**Present situation**	**Desired situation**	**Priority**	**Present situation**	**Desired situation**	**Priority**
1.1.	1	2	1	2	3	1	2,5	3		3	4	
1.2.	1	2	1	2	3	1	2,5	3		3	4	
1.3.	1	3	1	1	2	1	1,5	2	1	2	3	
1.4.	1	2		1	2		2,5	2,5		4	5	
2.1.	1	2		1	2		2	3	1	2	4	1
2.2.	1	2		2	3		2	3	1	2,5	4	1
2.3.	1	3	1	1	3		2	3	1	4	4	
2.4.	0	0		2	2		2,5	4	1	2	2,5	
3.1.	1	2		0	1		3	3		1,5	3	
3.2.	2	4	1	2	3		4	4		2	3	
3.3.	1	1		1	2		1	1		2	4	
3.4.	1	2		1	2		3	3		1,5	2,5	
4.1.	1,5	2,5		1	2	1	3	3		1,5	3	
4.2.	2	3		2,5	3		3	3		2	2,5	
4.3.	1	2		1	2		3	3,5		1	2	
4.4.	1	1		1	1		4	4		1	1	
Med	1	2		1	2		2,5	3		2	3,25	
PDB	3,5	1,5		-2,5	-4		6,5	1		-10	-9,5	
PoA		16			14,5			6,5			24	
D00	3	0		4	0,5		0	0		0	0	
D02	7	0,5		6,5	1,5		0,5	0		1	0	

As the table shows, the policy ambition of the Hogeschool Himbreeg is somewhere in the middle, compared with the others: university 3 scores significantly lower, while university 4 (which already scores very high) is very ambitious.

2.6. Appreciation and effects of the assessment results

On certain pre-determined moments during and after the assessment, the participants were asked to fill in some brief questionnaires about their appreciation of the assessment.
From the answers, it appears that the participants are enthusiastic about the way sustainability is approached with ***AISHE***. They think ***AISHE*** is a valid investigation tool: the results represent the actual situation with respect to sustainable higher education well.
Also, the application of ***AISHE*** made it clear where the strong and the weak points of SHE in the university are, regarding the attempts to implement sustainability in education and in the organisation policy. A good illustration of this is the fact that most of the participants did not know that the university as a whole had already signed the Charter for Sustainable Vocational Higher Education (a Dutch charter comparable to the Copernicus Charter). “Communication” (criterion 1.3) was one of the items that got a high priority. (By the way, this seems to be a regular thing: the same is true for 2 of the other 3 universities.)

The management of the study programme agrees with the opinions of the teachers. They too are enthusiastic about the ***AISHE*** assessment. The results form a solid starting point for the improvement and structuring of the policy development for sustainability in their university faculty – which they consider as very important, since the subject of their study programme (the food sector) is evidently dependent on a sustainable future.
Unfortunately, at the time this article is written, the policy plan has not yet been finished, so it is impossible to show some clear sustainability contents of it. But the management made it clear that a part of the budget certainly will be dedicated to implement the recommendations that resulted from the assessment.
The relevance – according to staff and management of the Himbreeg Food Science & Technology department – of ***AISHE*** is reflected in the fact that, shortly after the assessment, a “general” EFQM-HE assessment was done by the same department.

2.7. Future developments

With several of the assessed universities, it is agreed that in one or in one-and-a-half year the assessment will be repeated; perhaps even in all of them. This will enable the project team to investigate, which part of the plans resulting from ***AISHE*** will appear to be successful.

Consultancy

In the mean time, the number of assessments will grow. Now that the ***AISHE*** instrument has been tested, evaluated and completed, a follow-up project has started (again financed by the Dutch Ministry of Environment). During this second project, the ***AISHE*** team will be able to work as consultants, assisting universities that are working on the implementation of sustainability in their education.
Of course, ***AISHE*** will be used as a tool for this consultancy. But besides, other options are available, before or after an ***AISHE*** assessment, as the box shows:

Elements of a more intensive consultancy (optional)

Before:

- Introduction of sustainable development with the staff, e.g. through presentations or workshops, as a preparation for an ***AISHE*** assessment
- Introduction of sustainable higher education with the management, e.g. through presentations or discussions, as a preparation for an ***AISHE*** assessment

After:

- Assistance with the translation of the results to policy- and activity plans
- Assistance with the application of the results in relation to the (Dutch) Certificate for Sustainable Higher Vocational Education or in relation tot the Copernicus Charter
- Assistance with the integration of ***AISHE*** and SHE in the internal quality management
- Assistance with the application of ***AISHE*** results in the preparation of visitations and/or accreditation

Training of sustainability coordinators

A second objective of the second ***AISHE*** project is the training of staff members of universities (e.g. quality- or sustainability co-ordinators) with respect to sustainability in higher education. Here, too, ***AISHE*** will be a tool within the training programme.

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Websites

- Committee for Sustainable Higher Education (CDHO): Secretariat through University of Amsterdam, tel. +31 (0)20 5256266, www.dho.nl
- European Foundation for Quality Management (EFQM), www.efqm.org
- INK (formerly: Instituut Nederlandse Kwaliteit), www.ink.nl