Towards a perfect learning process - where is Sweden?[1]

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Abstract

Purpose of the paper: *Competition gets tougher with globalization. Information and knowledge are shared like never before, putting pressure on businesses and nations to provide effective and efficient means of learning. Learning could be seen as the educational process from the user perspective. How could a perfect learning process look when based on process theory and how does reality compare with this? One option is defining a perfect process as doing the right thing based on stakeholder needs, doing it in the right way by minimising resource use and by being adaptable.*

Methodology*: Applying the proposed educational process on Swedish HEI educational processes indicates that the model can be used.*

Findings*: The results from the study indicate that Sweden seems to perform well in many areas but also that there are important areas of improvement, such as lifelong learning and the integration of sustainability into education.*

Research limitations*: The proposed process has only been partly tested.*

Research and managerial implications: *The strength of the process approach.*

Originality/value of paper*: Basic process theory in a new context.*

Key words: education; learning; process; stakeholders; sustainability

1. Introduction

Competition is getting tougher with globalization. Information and knowledge are being shared like never before. This puts pressure on nations and companies to improve learning. The time when almost everybody will have access to the same information is approaching. In this not so distant future, the countries and companies that make full use of their human capital in the best way will have an important competitive edge. Ideally, every individual will learn what he or she needs to as efficiently as possible over his or her lifetime. With expected working careers spanning some 40 years there will be a need for substantial additional learning and relearning throughout a person's working career - i.e., lifelong learning.

There are many improvement philosophies that could support in improving educational processes. One of these is Lean Management, originating from Toyota and the car manufacturing sector, which has become popular in many other fields such as health care (Mazzocato

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et al., 2010). However, there still seem to be few applications of Lean Management within learning (Anthony *et al.*, 2012). Isaksson *et al.*, (2015a) discuss "lean lifelong learning" by focusing on how it could be applied in distance education. When applying a Lean approach with waste reduction it becomes apparent that Lean might be more focused on improving existing processes than on creating new and more customised products. Isaksson *et al.*, (2015a) observe that customer need based issues such as access to courses, availability of courses and their level are more related to the educational product than to how courses are delivered. The Lean approach, using seven types of waste, does not seem to cover these aspects (Liker, 2004). Going back to basic process theory could therefore help in identifying the elements of a perfect learning process.

We focus on learning and educational processes in Higher Education Institutions (HEI). The learning process could be defined as the educational process seen from the learner perspective. The educational process would then be the act of providing knowledge and would be the producer perspective, where the producer could be a public or private organisation.

Change in society should also change what and how universities are educating. Rapid change in society requires adaptable educational processes. Along with the many existing threats to global sustainability, e.g. global warming, there is an increasing understanding that business as usual is not an option (WBCSD, 2010). Isaksson and Johnson (2013, p. 3691) state that: "Those graduating today are those that will have to deal with all the challenges of sustainability. It could be expected that universities take a leading role in the promotion of sustainable development". This makes the university approach to the requirements of sustainable development a good area of testing adaptability. We use the expressions "sustainability" and "sustainable development" interchangeably.

The first objective of our paper is to propose how a generic perfect process that highlights critical elements, could look. The second and main objective is to propose a framework for a perfect educational process. The third objective is to apply the model to highlight the situation in Sweden.

2. Methodology

The method for the first objective is based on reviewing basic process theory. Egnell (1996) argues, based on Harrington (1991) and Melan (1992), that process management should maintain an overall perspective and identifies three properties for all processes: quality, efficiency and adaptability. Quality is defined as satisfying customer needs, efficiency as process utilisation and adaptability as how well processes are adapted to new conditions. This is taken as a basis for further discussions on the issue of the perfect process. We review the right thing of the perfect process based on a stakeholder discussion where the main identified stakeholders are People and Planet (Isaksson *et al.*, 2015b). The right thing is seen as the perfect value flow with zero costs due to poor quality. Adaptability is interpreted as the continuous change of the product and value flows to ensure that the right thing is produced in the right way over time. The

result is a proposed perfect process that does the right thing in the right way over time.

The second objective is achieved by adapting the proposed general process to educational processes based on identifying main stakeholders and main stakeholder needs.

The third objective of testing the educational process model is carried out using Sweden as a case study. The reason for this choice is mainly based on the facility of access to national information through the web-site Studera (2015). Additionally, Sweden is an OECD country with high rankings within economic, environmental and social dimensions (Isaksson and Johnson, 2013). Any detected improvement potential could therefore be relevant to most countries in the world. We study the educational processes following secondary school and throughout a person's remaining lifetime.

For the aspect of doing the right thing we analyse the overall information available in Studera (2015). For the aspect of doing the thing right we additionally study a sub-set of the database by looking at distance courses for sustainability. For the aspect of adaptability we study data from six chosen Swedish universities, which are Chalmers, Gothenburg University, Karolinska Institutet, Luleå Technical University, Stockholm School of Economics and Uppsala University. Gothenburg University is identified as a benchmark university in relation to sustainable development in Isaksson and Johnson (2013). Also, Chalmers is known to focus on sustainability. Karolinska Institutet and Stockholm School of Economics are ranked numbers 1 and 2 in Sweden (URANK, 2014) and are benchmarks in this sense. Uppsala University and Luleå Technical University were chosen because of their good access to information. For the aspect of adaptability we used the same data as above with focus on information and how the issue of sustainable development is dealt with. Here we use relevant parts of the data-analysis proposed in Isaksson and Johnson (2013).

3. The Perfect Process

There are many process definitions but they generally have reasonably similar content. Below is a typical one:

A process is a network of activities that are repeated in time, whose objective is to create value to external or internal customers. (Bergman and Klefsjö, 2010, p. 456).

The starting point for the perfect process is based on the ideas of Egnell (1996) assigning properties of quality, efficiency and adaptability to processes. Quality is seen here as doing the right thing for the customer, who is the one that the process delivers value to (Bergman and Klefsjö, 2010). This could be described as the process that does the right thing. This means that the delivered product, defined as any combination of goods and services, is what the customer wants and needs - the perfect product. Efficiency is defined as how well processes utilising resources could be seen as doing the thing in the right way. This could be seen as the waste reduction focus of Lean Management. There is also a link to the cost of poor quality, a concept

which has many definitions. The one used here is: "Cost of poor quality are costs that would disappear if systems, processes, and products were perfect" (Wikipedia, 2015). Since we want to include the perfect product into the perfect process, this would have to be rewritten saying that the perfect process has zero costs of poor quality when it includes the perfect product and value flows, defined as chains of activities. In a perfect process the adaptability is such that products and value flows change continuously, thus reflecting customer needs. This means that the products and value flows become perfect over time. In summary, the perfect process does the right thing in the right way over time. Even if it is unlikely that any perfect process will be found in the real world, defining this process enables the setting of virtual benchmarks.

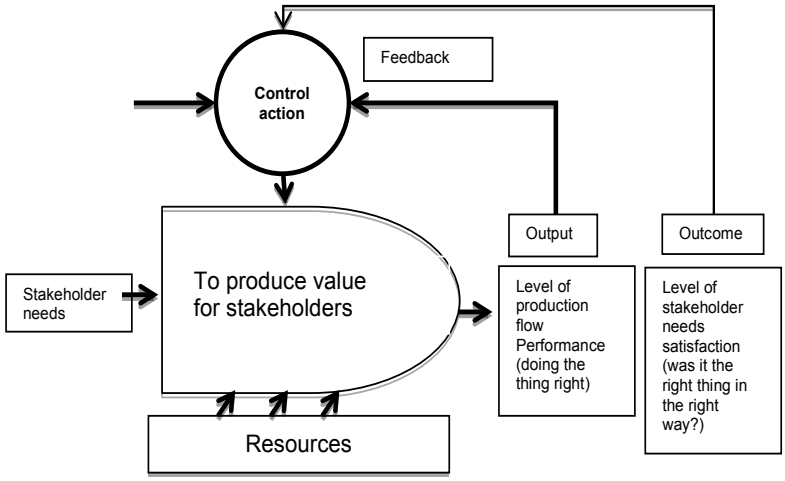
Isaksson (2006, p. 634) proposed a process to be "a network of activities that, by the use of resources, repeatedly converts an input to an output for stakeholders". This definition extends value creation to all stakeholders, which complicates things, since there will most likely be conflicts of interest. Isaksson (2006) also proposed that processes could be seen as systems. This means that, in the system studied, the perfect process would deliver value to all stakeholders while minimising the use of resources. Seen from the perspective of making best use of the resources in a system it is important to identify all stakeholders and interested parties. To simplify the discussion, the word "stakeholders" is used to refer to everybody having an interest in the system including customers, traditional stakeholders, affected and interested parties, nature and future generations. In order to do the right thing the studied system must comply with the requirements of the outer system it is part of. Isaksson *et al.*, (2015b) argue that, on the global level, there are two principal stakeholders that could be viewed as nature, or Planet, and humanity, or People. In the wake of resource scarcity and with focus on sustainability it could be argued that in any process based system the focus should mainly be on stakeholder needs, with stakeholder wants having second priority. The perfect product, based on this, should therefore be measured in terms of satisfying collective stakeholder needs. However, maximising integrated stakeholder needs is not enough but should be compared with the use of necessary resources. The perfect product would maximise stakeholder satisfaction while minimising resource use in such a way that the performance could be called "sustainable". Sustainability would mean that the system could continue operating at its current level over time without affecting the future existence of the system at the previous level.

In Figure 1 a model to be used for the perfect process is presented. The output is defined as the measurable result that the process delivers. This could in many cases be measured with typical KPIs for quality, time, cost etc. Stakeholders then assess the output, which leads to a level of needs satisfaction. Here, there is the problem of possible differences between stakeholder needs and stakeholder wants. In a sustainable system the focus is on stakeholder needs. In practical terms, stakeholder wants are the ones guiding decisions. For the process to be adaptable the feedback needs to have an immediate effect on the product and on the value flows delivering the product. These changes take place in what is described as resources in

Figure 1. This could consist of equipment, number of employees, employee competence, culture etc.

In processes described as systems there are many stakeholders, but there should also be a customer that forms the *raison d'être* of the process - a clear customer need that justifies the process. Defining the perfect product in terms of needs could therefore include a review of the main value produced compared to the main harm done (Isaksson *et al.*, 2015b). The right thing could be defined as the specification of a sustainable product. Doing the thing right would then be producing according to the specification with zero defects and deviations. Adaptability requires good feedback from current product and process performance. Additionally there is a need for having perfect input and interpretation from innovations in technology and processes.

Fig. 1: Proposed elements of a perfect process



Source: Own elaboration

3.1 Perfect Learning and Educational HEI Processes - Right thing

The learning process is defined based on a user perspective. The educational process is defined as the organisation of learning for the fulfilment of individual knowledge needs. In higher education, the owner of this process is generally a public or private organisation. The individual could be seen as the main customer of learning. Learning could be a reason in itself, as could be getting a good education, which could be described using the German word *Bildung*. Only striving for *Bildung* was probably more common in the past, when higher education was mainly for nobility. In modern times, most students are striving for employability. This means that one important customer is the future employer. States are also important customers and could be seen as looking for good citizens and good taxpayers. In any country high unemployment is a problem, which means that employability is an important outcome of education. Profit and

generated taxes should be based on good use of resources in relation to the main stakeholders Planet and People.

Using a Pareto approach, the main stakeholders that have been identified for national learning and educational processes are HEIs, students, employers, State, Planet and People. In Table 1, the identified stakeholders have been listed and compared with their assessed needs. The authors then estimated the strength of the needs for different stakeholders. This is mainly done to exemplify the proposed work method. The identified and assessed stakeholder needs are not exhaustive but have been limited to those deemed most important. Stakeholder needs which have not been included in Table 1 and apply for young students, are moving from home and joining student life.

Tab. 1: Assessed stakeholder needs and proposed normatively based relative strength (x= low; xxx=high)

Need / Stakeholder	Common education "Bildung"	Employability	Profit/ payback on education	Understanding sustainability	Comments
HEI	x	xxx	x	xxx	Most HEIs are interested in a high ranking, which means having many applying students. Interest in profit varies. Here, it is argued that the focus should be on employability and understanding sustainability.
Sec. School student	x	xxx	xx	xxx	Students are mainly assessed to be interested in employment, but there are also social elements and educational needs.
Mature student	xx	xx	x	xxx	Mature students often have a job and study out of interest.
Employer	x	xxx	xxx	xxx	Employers are probably mostly interested in getting good value out of employees. Here, it is argued that the focus should also be on understanding sustainability.
State	x	xxx	xx	xxx	The State is expecting taxpayers but also well functioning citizens and should also worry about how sustainability is assured.
Planet	xx	xxx		xxx	Understanding planetary boundaries as common education should improve care for the planet. Citizens that are also employed have more influence.
People	xx	xxx		xxx	Understanding social issues will help focus on People.

Source: Own elaboration

The ratings in Table 1 are set based on assessed needs from a normative point of view. These ratings should be further discussed. The purpose here is to demonstrate how to identify main indicators for the right thing. The content of Bildung is often discussed. In some cases the content is related to understanding sustainability, which should promote sustainability.

Tab. 2: Assessed stakeholder harm for the values of employability and understanding sustainability (x= low; xxx=high)

Harm Stakeholder	Cost	Time	Carbon footprint	Social justice	Comments
HEI	xxx	xx	x	xx	Cost of the educational process needs to be controlled and throughput time should not be too long. Carbon footprint from HEI is relatively low. Recruiting of students should be fair and not based on payment ability.
Sec. school Students	xxx	xx	x		Main sacrifice is cost and time for education.
Mature student	xx	xxx	x		Mature students often have a job and study out of interest.
Employer	xx	x			Employers are interested in benefitting from talent without having to pay a fortune.
State	xxx	xx	x	xxx	The State has limited resources to support education. Many countries have a political interest in seeing that students are extensively recruited.
Planet			x		Carbon footprint of education is limited
People	xxx			xxx	Cost of education and ways of entering HEI are important People issues.

Source: Own elaboration

There are some difficulties in assessing the level of *Bildung* and in assessing its value. In the end only the student can make an assessment of the perceived value. From a needs perspective it could be argued that if *Bildung* is of any value it should positively affect employability. That is, being educated should be something that other people can see and appreciate. The right thing, based on an interpretation of Table 1, would be employability and understanding sustainability. It could be assumed that even if employers today do not specifically ask for competence in sustainability this could soon become an issue.

The produced values consume resources in the form of costs and time. In Table 2 four harm indicators have been identified and compared with the same stakeholders as those identified in Table 1. The main harm indicators chosen for comparison with value are cost and time of education.

Social justice is important but left out here due to lack of data for operationalization. The right thing in education could, based on the above, be expressed as employability and understanding sustainability compared to the related cost and the time it takes. These relations are exemplified for the stakeholders HEI and student in Table 3.

Tab. 3: Value per harm indicators for student and HEI and proposed benchmarks

Stakeholder	Employability/ price	Employability/ time	Payback on investment	Understanding sustainability/ time	Comments
Student	xxx	xxx	xx	xxx	Benchmarks for the perfect process are 100% employability and 100% understanding sustainability in minimum time and minimum cost to be defined.
HEI	xxx	xxx	xxx	xxx	The same benchmarks should be valid for HEI

Source: Own elaboration

A reasonable student expectation for programs leading to a degree is that there is information on cost, necessary time, chances of employability and expected salary. Sustainable university work could be studied by looking at policies and plans for sustainability. Isaksson and Johnson (2013) propose a set of questions that could be answered with a web page analysis. Three of the questions are: "Easiness of finding information", "Access to and relevance of policy on sustainable development" and "Overall management of SD". The logic is that it should be easy for the interested student to see how the university is working with sustainable development.

The assessment of three questions has been adapted for Table 4 together with other issues that have been assessed with a scale ranging from 1 to 5, with 5 being the benchmark.

Tab. 4: Proposed criteria for testing information on important issues describing the right thing on a program level

Level	1	2	3	4	5
Cost of fees US$/ year	>20000	10000-20000	5000-10000	0-5000	Free of charge
Necessary time in years to finalise	>5	4-5	3-5	2-5	Customized
Information on employability	No information	Some	For about half the programs	For most programs	For all programs
Employability	Very low	Low	Medium	High	Guaranteed
Information on salary	No information	Some	For about half the programs	For most programs	For all programs
Salary	Very low	Low	Medium	High	Very high
Understanding sustainability - information	No information found	Some information, which is hard to find	Sustainability is mentioned in various documents	There is a clear logic from policy to plans and follow up	It is clear how the university works with sustainability and that this is in focus
Understanding sustainability - policy	No policy found	Policy as part of environ-mental focus	Policy with focus on sustainable development	Policy with focus on sust. dev. explaining definitions	Policy for sust. dev. explaining definitions in relation to the Triple Bottom Line
Understanding sustainability - education	No information or no courses in sustainability	Minimal focus on sustainability education	Basic sustainability course	In addition to basic course, sustainability is part of several topics	Sustainability is taught in detail and forms part of every topic
Availability of education (right thing)	No programs on distance	Few programs on distance	Some programs on distance	Many programs on distance	All programs on distance

Source: Own elaboration

3.2 The Perfect Learning and Educational HEI Processes - Right way

The perfect educational product, seen from the student perspective (learning) and from the HEI perspective (educating), needs to be defined in further detail as an input for doing this the right way. However, with the above indications, it is already possible to visualise important indicators and benchmarks. Isaksson *et al.*, (2013) suggest that the following Lean waste categories are suitable for assessing learning and educational processes: inventory, waiting, over-production and defects. Inventory is defined as frontloading of learning, meaning that knowledge is accumulated long before it is needed. The risk here is that the knowledge inventory will degrade considerably. Theoretically, just-in-time learning would be better. Waiting could be a major waste issue from the learner perspective. Isaksson *et al.*, (2013) assess, based on examples from Swedish university education, that about 90% of the total process time - from the need's establishment to the use of knowledge - could be wasted. The most important waste consists in waiting for courses to start. Over-production is characterised as education that does not lead to employment. This issue is more related to doing the right thing. Defects represented by students who do not finalize their course or program. Here, course throughput is a good KPI.

Isaksson *et al.*, (2015a) combine a Lean perspective on distance education with a focus on customer needs. They propose a test with five questions with Lean waste categories in brackets:

1. Existence: Does the required educational product exist?
2. Extent: Is the extent of it as required (overproduction)?
3. Availability: Is it possible to enter the education in a planned way? The course could exist but not be available due to overbooking.
4. Waiting: When can the education be accessed (waiting)?
5. Pace: Is it possible to adapt the speed of learning (over-processing, waiting)?

The Existence of a course relates to doing the right thing - have producers responded to the demand? Similarly, Extent is an issue of educational design, which could lead to overproduction. In Sweden the size of courses is often standardised and the minimum size in many universities corresponds to some 130-200 hours of student work. For somebody working and needing an introduction in Lean the extent could, in many cases, be excessive, leading to overproduction compared to needs. Also, Availability could be seen as an issue related to the right thing. Isaksson *et al.*, (2015a) demonstrate that the chances to enter many distance courses in Sweden are low, which makes educational planning very difficult for mature students. Waiting is a major issue for doing the thing right. Another problem with lack of customisation is the pace of learning and the available period.

Within the field of distance education there is a commonly agreed definition of the ultimate distance education as being place and time independent. With focus on defining benchmarks we could claim that the best way of realizing everybody's learning potential for all education would be to be able to start at any time and follow any speed, including intermittent learning, from an individual level to an individual target.

From a theoretical point of view, mass customisation of education could be a way to reduce waste. From the student learning process perspective, the Lean "one-piece flow" could be very attractive for maximising learning value per time. In order to maximise the rate of learning the way of learning should be individualized. Executing the learning process in the right way should start with employer requirements followed by an education based on a just-in-time approach where knowledge needs drive education and where there is minimal frontloading of knowledge. The criteria for assessing the level of doing the right thing and doing it right are presented in Table 5. Table 5 is based on Isaksson *et al.*, (2015a) with the addition of the *Customised pedagogy level. The assessment is intended for all types of courses and not only on di*stance courses as in the original version.

The proliferation of Massive Open Online Courses (MOOCs) presents more and more courses openly on distance. In the spirit of MOOCs it could be foreseeable that an increasing number of courses will be provided for free on the net. Isaksson *et al.*, (2015a) checked some of the leading MOOC-providers, i.e. Coursera, Udacity and edX for quality courses. A check using the word "sustainability" in June 2015, revealed that Coursera offers 20 courses, three of which are self-paced and can be started at any time. For edX 31 courses were found, 3 of which are self-paced. There were no hits on Udacity. Courses are mostly free of charge but they could offer a verified certificate for about 50 US$. This highlights the existing technical opportunities and the competition that traditional university courses will be facing in the future.

Tab. 5: Proposed criteria for doing the right thing and doing the thing right based on course level Isaksson et al., (2015a)

Level	1	2	3	4	5
Existence	No courses found	Some courses	Some courses at different levels	Many courses at different levels	Many relevant courses at many different levels
Existence of distance courses	No courses found	Few courses	Some courses	Many courses	All
Existence of distance courses in sustainability	No courses found	Few courses	Some courses	Many courses	All
Extent (right thing)	Courses of one extent only	Some variation in extent	Variation in extent	Some courses in the entire range from 1-30 ECTS	Several courses ranging from 1 ECTS and up
Availability (right thing)	Very hard to access, > 5 appl./place	Difficult to access 2-5 appl./place	Medium difficulty of access <2 appl./ place	Good access; <1 applicant/ place	Guaranteed access
Waiting (right way)	Waiting > 6 months	3-6 months	1-3 months	<1 month	Course can be started immediately
Pace (right way)	Courses with one pace only	Courses with some variation in pace	Courses ranging from 25-100%	Courses ranging from 10-100%	Many courses that are self-paced
Customized pedagogy (right way)	No customization of learning	Some limited customization of parts of the course	Some customization of parts of the course	Customization of most parts of the course	Fully customized to learning preferences

Source: Own elaboration

3.3 Being adaptable with course content and delivery

Both output and outcome need to be monitored over time to assess the level of cost of poor quality. In order to be able to follow up performance over time, good processes are needed for their feedback from output and outcome as well as from relevant innovations, as demonstrated in Figure 1.

Tab. 6: Proposed criteria for testing adaptability

Level	1	2	3	4	5
Alumni satisfaction measurement	No measurement	Mentioned	Some measurements	Results with target	Results on target
Employer satisfaction	No measurement	Mentioned	Some measurements	Results with target	Results on target
Last change in course syllabus – years	>5	3-5	2-3	1-2	<1
Minimum time for changing courses syllabus – months	>12	8-12	4-8	1-4	<1
Sustainable development in yearly report	Report not found or no mention of sd	Mentioned in a relevant way at least five times	Website information on sustainable development	No information	Well ex-plained (links from start page)
Changes towards sustainability based on yearly report and website information	No information	Some information on sustaina-bility performance	Defined indicators for sustainability are reported	Defined and relevant indicators for sustainability are reported with trends	Clear progress towards goals based on global system limits

Source: Own elaboration

The output gives information on throughput, learning results and student satisfaction. Most indicators at this level will relate to doing things right. The outcome or stakeholder satisfaction could be based on alumni and employer satisfaction surveys. For innovations within the scope of taught topics, lecturers are responsible for knowledge management. An issue where responsibilities are not as clear could be the introduction of modern technology affecting pedagogy. Changes in studying could be carried out based on results by means of output and outcome, but also by studying changes in control documents such as program plans and course syllabi. In a further step how quickly courses and programs can be changed when following ordinary routines could also be studied. In a world where a new product is invented in January, goes global in April and is obsolete by November taking more than a year to change a course syllabus could be a problem. Theoretically, the syllabus should provide information both on the course's content and on how learning takes place. This means that course syllabi could be used as one way to assess adaptability. Adaptability to sustainability requirements could be assessed based on reported results. The yearly report could be used to assess reported changes towards increased sustainability. A university with a focus on sustainability should also report results on the web page, thus ensuring good visibility.

4. Swedish Case Study

In Sweden, all university education for Swedes and members of the European Union is free of charge. This means that the cost of education is related to the time that is needed to complete the program.

Tab. 7: Swedish program education in HEI

	Programs	Distanceprograms	Part time 50% or less of all progs	Part time 50% or less distance	Programs on sustain. devel.	Comments
All	3882	366 (9%)	268 (7%)	155 (4%)	73 (2%)	Pace is 25-50%; Several of the sd-programs seem to be traditional programs
Chalmers	125	0	0	0	12 (10%)	3 of the programs include the word "sustainable"
Stockholm School of Economics	8	0	0	0	0	
Gothenburg University	495	9 (2%)	9	9	9 (1%)	
Karolinska Institutet	55	14 (25%)	14	12	0	Several one year specialist distance courses for nurses
Luleå University of Technology	172	24 (14%)	4	4	1 (1%)	Engineering program – the word "sustainable" is not part of the name
Uppsala University	246	8 (3%)	13	2	9 (4%)	None of the programs include the word "sustainable"

Source: Studera (2015). Swedish Council for Higher Education, available at: http://studera.nu/startpage/, accessed July 8, 2015.

Studera (2015) lists 40 HEIs compared to the 28 found in the ranking list for Swedish universities (URANK, 2014). The difference is made up of special institutions such as those focusing dance, art and sports. Swedish universities have about 90 000 new students every year (UKA, 2015). Studera (2015) also provided some information on employability and salaries for certain chosen professions. In total, 92 different professions are mentioned. There is a prognosis for access to jobs within 5 years based on three levels (difficult, medium and easy). For 21 professions this assessment is missing. There is also information on starting salaries and salaries based on experience that is divided between men and women within the state,

municipality and private sectors. For 27 professions the salary information is missing. In Table 7 some basic data are presented. Using the information from Table 7 and other information from the Studera (2015) helps us fill in some requested information in the Table 4 template. Results from Table 8 show that Sweden has an attractive educational system, which is free of charge and often leads to well-paid employment.

Tab. 8: Testing parts of Table 4 in Swedish education

Level	1	2	3	4	5
Cost of fees US$/ year	>20000	10000-20000	5000-10000	0-5000	*Free of charge*
Necessary time in years to finalize	>5	4-5	*3-5*	2-5	Customized
Information on employability	No information	Some	*For about half the programs*	For most programs	For all programs
Employability	*28% (hard)*		*25% (medium)*	*48% (easy)*	
Information on salary	No information	Some	*For about half the programs*	For most programs	For all programs
Salary (relative OECD)	Very low	Low	*Medium*	*High*	Very high
Understanding sustainability – education program level	No information or no program in sustainability	*Minimal focus on sustainability programs (2%)*	Some sustainability programs	Many sustainability programs	All programs have some sustainability content
Availability of education (right thing)	No distance programs	*Few distance programs (9%)*	Some distance programs	Many distance programs	All distance programs

Source: Own elaboration. The proposed results are in italics

In Sweden there has been a university law since 2006 that requires all HEIs to work with sustainable development (UL, 2006). With reference to this the result, with 2% of all programs mentioning sustainable development, is low. Many of the programs that are mentioned when searching for sustainable development have another focus and do not mention sustainable development in the program title. Availability for mature students is low when measuring part time distance programs, which is 4% of the total number of programs.

Doing the right thing is based on national data from all universities and on data from six chosen universities. The results are found in Table 9. These are further interpreted using the Table 5 template. The results of this are presented in Table 10.

Tab. 9: Swedish courses in HEI, (Studera, 2015)

	Courses	Distance courses	Part time 50% or less distance	Courses on sustain. devel. all	Courses on sustain. devel. distance	Comments
All	15439	3713 (24%)	3282 (21%)	153 (1%)	40 (0.3%)	
Chalmers	No results					Focus on programs
Stockholm School of Economics	No results					Focus on programs
Gothenburg University	1094	148 (14%)	124 (11%)	12 (1%)	2 (0.2%)	
Karolinska Institutet	55	17 (31%)	17 (31%)	0	0	Most programs
Luleå University of Technology	746	156 (21%)	144 (19%)	7(1%)	5 (0.7%)	
Uppsala University	2016	364 (18%)	347 (17%)	33 (2%)	7 (0.3%)	

Source: Studera (2015). Swedish Council for Higher Education, available at: http://studera.nu/startpage/, accessed July 8, 2015.

The average availability of distance courses on the national level is relatively high, with 24% of all courses. However, not all universities provide separate courses, but instead only provide programs, as in the case of Chalmers and the Stockholm School of Economics. Studying sustainable development on distance as part of lifelong learning is difficult. The number of distance courses is low.

Only selected parts of the assessment in Table 10 have been carried out. Numerous courses on different levels are found. The course extent has been reviewed by randomly viewing a sample of some 500 courses in Studera (2015). More than 50% of these were 7.5 ECTS, which corresponds to about 200 study hours. The shortest courses with any frequency noted are 5 ECTS, or some 130 hours. Compared to the need for lifelong learning this extent could be too much.

The results for waiting are based on how the application system in Sweden works. Applications can only be handed in twice a year, April 15 and October 15, as the deadlines to attend courses starting in September and January, respectively. This means that the average amount of waiting time depends on when the need for education is perceived. Therefore, the shortest amount of time from the application to the beginning of the course is about 3 months and the longest 10 months. Some universities leave the application open after the deadlines when places are available. This shortens the waiting time.

Tab. 10: Course based results with the structure of Table 5 and results from Table 9.

Level	1	2	3	4	5
Existence - all courses (course at appropriate level) - indicative only	No courses found	Some courses	Some courses at different levels	*Many courses at different levels*	Many relevant courses at many different levels
Existence of distance courses	No courses found	Few courses	*Some courses (24%)*	Many courses	All
Existence of distance courses in sustainability	No courses found	*Few courses (0.3%)*	Some courses	Many courses	All
Extent (right thing)	Courses of one extent only	*Some variation in extent*	Variation in extent	Some courses in the entire range from 1-30 ECTS	Several courses ranging from 1 ECTS and up
Waiting (right way)	Waiting > 6 months	*3-6 months*	1-3 months	<1 month	Course can be started immediately
Availability (right thing) - based on Isaksson and Johnson (2013)	Very difficult to access > 5 appl./place	Difficult access 2-5 appl./place	Medium access <2 appl./place	Good access; <1 applicant/ place	Guaranteed access
Pace (right way)	Courses with one pace only	Courses with some variation in pace	*Courses ranging from 25-100%*	Courses ranging from 10-100%	Many courses that are self-paced
Customized pedagogy (right way) - not analysed	No customization of learning	Some limited customization of parts of the course	Some customization of parts of the course	Customization of most parts of the course	Fully customized to learning preferences

Source: Own elaboration. The proposed results are in italics

The results presented for availability are based on Isaksson and Johnson (2013), who noted that while the demand for distance courses has been increasing, its supply has been reduced in Sweden. This trend seems to be continuing.

The results for adaptability are presented in Table 11. In Studera (2015) it is possible to search for the pace of the course. At the aggregated level there are many different paces to choose from. However, this does not mean that the student can choose the pace for a particular course. This aspect has not been studied in detail. The rating for pace is probably lower than indicated in Table 10. The customization of pedagogy criteria has not been studied.

Tab. 11: Adaptability based on structure in Table 6 and review of 6 universities

Level	1	2	3	4	5
Alumni satisfaction	*No measurement*	Mentioned	Some measurements	Results with target	Results on target
Employer satisfaction	*No measurement*	*Mentioned*	Some measurements	Results with target	Results on target
Last change in course syllabus - years	>5	3-5	2-3	*1-2 (3.8)*	<1
Minimum time for changing course syllabus - months (based on 2 samples only)	*>12*	*8-12*	4-8	1-4	<1
SD in yearly report (assessment based on structure from Isaksson and Johnson (2013)) - average	Report not found or no mention of sd			*Average (4.3)*	Mentioned in a relevant way at least five times
Website info on SD (assessment based on structure from Isaksson and Johnson (2013)) - average	No information			*Average (3.8)*	Well explained with links from the starting page
Changes towards sustainability based on yearly report and web-site information	*No information (1.5)*	*Some information on sustainability performance (1.5)*	Defined indicators for sustainability are reported	Defined, relevant indicators for sustainability are reported with trends	Clear progress towards goals based on global system limits

Source: Own elaboration

The results in Table 6 are only indicative. The main area of improvement should be educational adaptation to sustainability requirements.

5. Discussion

The present paper covers many areas superficially, with the purpose of testing the idea of using process theory to define educational processes in HEIs from a stakeholder perspective. The proposed indicators in Tables 4, 5 and 6 have been partially exemplified. The results are intended as a preliminary demonstration of the practical usability of the concept.

Results indicate that there are good opportunities in making education available for distance students. In Sweden, the educational offering is still focused on campus students, who are mainly young students studying for their degree. The increasing number of mature students will not attend campus courses and would rely on distance courses in most cases. Technically, making all courses available on distance should not be too much of a challenge, thinking of the increasing number of offered MOOCs. A country focusing on realising its talent potential should make studying easy. Provided the political will supports it, it would be easy for Swedish universities to change directives and focus more on lifelong learning. Using

modern technology for net-based learning should enable this with limited additional resources.

Swedish universities seem to be placing sustainable development high on the agenda, but there are few results on its progress. This could signify that the progress towards increased sustainability is not working as well as it should. Also, there is indication that the process of updating courses is too slow. Changing course syllabi seems to be a very lengthy process that involves a great amount of wasted time.

One issue which has not been studied is related to pace and the possibilities a student has of finishing studies earlier. At the program level this could have an important impact on the interest of taking a degree. The average study year in Sweden is 40 weeks, or 1 600 hours. This means that there could be considerable waste in waiting. In an ideal situation, the student could set the pace of his or her studies and should be able to study for a chosen number of hours per year without taking any long summer breaks. This is currently not possible in the system.

6. Conclusions

The first objective was to propose a framework for a perfect process. The proposed answer for this is based on the idea that every process can be described with doing the right thing, doing it the right way and being adaptable. The right thing in the studied system is defined by the stakeholders in Figure 1. In an ideal situation, priorities are set based on stakeholder needs, which need to be compatible with system limitations set by Planet and People as the main stakeholders. The right way is defined as making the best use of resources by delivering the value that is needed with minimal harm. The adaptable process does the right thing in the right way over time with the help of continuous feedback processes.

The second objective was to propose a framework for a perfect educational process. The proposed answer to this consists of an interpretation of who the main stakeholders are and how stakeholder needs could be expressed in order to establish indicators for this. The proposed indicators are found in Tables 4-6.

The third objective was to demonstrate the application of the proposed educational process model. This is done by applying the identified indicators to Swedish educational processes. The results are presented in Tables 8-10. Results show that Sweden has worked with user information for students such as information on work opportunities and salaries. There is also relatively good information on how universities work with sustainability. The largest improvement potential seems to concern adaptability and improving feedback processes such as getting information from alumni, employers and work with sustainable development.

The conclusion is that the idea of a perfect process could be developed to support improvement of educational processes by applying a customer needs focus in the larger context of stakeholder needs focus. Viewing the learning process from the learner perspective could open up for individualised learning in progress towards mass customisation of education to enable all students to make full use of their potential.

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