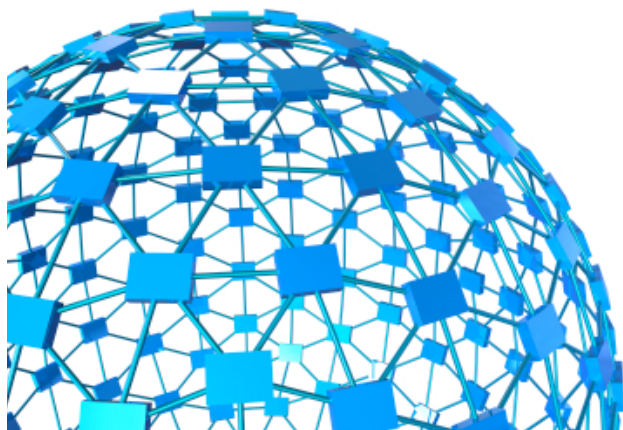


Bachelor thesis
Henri Jansen

Universities and societal pressures



UNIVERSITY OF TWENTE.

Bachelor thesis

Universities and societal pressures

Course: Business Administration
University: University of Twente
School of Management
and Governance
PO box 217
7500 AE Enschede
The Netherlands

Author: **Henri Jansen**
Student number: s0164763
Date: 11 November 2010

First supervisor: **Dr. P. Benneworth**
Second supervisor: **M.R. Stienstra, MSc**

Preface

This thesis is the last step in obtaining by bachelor's degree. It is about the University of Twente, and its response to societal pressures. I have looked at the university from a business administration point of view. To do this, I have applied theories from this discipline to the university. Literature from the field of higher education policy studies has been used as well. This has resulted in, I hope, an enlightening view on the workings of a university.

Dr. P. Benneworth has guided me during the process of writing this thesis. He has provided meaningful insights and critically reviewed my thesis during the process of writing it. I want to thank him for this support.

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I have been able to interview eight persons from within the University of Twente. Without these interviews, the research I conducted would not have been possible. Some interviewees have chosen not to be referred to in the final thesis, so their names will not be mentioned in this preface. I want to thank:

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Henri Jansen
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Summary

Society is facing a number of ‘grand social challenges’. These challenges are very diverse. Examples of these challenges are: climate change, resource scarcity, urban sustainability, and efficient, high quality health care.

Organizations will somehow have to deal with these ‘grand social challenges’. Ackoff (1999) defines these kinds of challenges as ‘multi-disciplinary messes’. From Greenwood’s (2007) definition, it becomes clear that these are the kinds of problems that university graduates will have to deal with in their working life. These are problems that will have to be addressed from different angles. The reaction of universities to these challenges is discussed in this thesis because of the unique and diverse roles universities have played in our society throughout the previous centuries. The unique characteristics a university possesses make it interesting to study how this organization is reacting to these challenges.

Universities have not always been thought of in the same way. The ‘idea of a university’ has changed over the past decades (Grit, 2000). First, universities were seen as a ‘classical’ institution, in which for example knowledge was seen as a product of the human mind. Later the critical university emerged, where knowledge became a social phenomenon. More recently, the entrepreneurial university came into existence. Knowledge became an economic commodity. All these stages can be interpreted in terms of different pleas from which universities operate.

In this research, the possibility of a new plea, coming into existence in response to the ‘grand social challenges’, has been examined. The university of Twente has been used as a case study. And within this institution, the educational function has been researched. We have primarily done this in order to keep the research manageable.

By examining the nature of change within the different processes the educational practice consists of, we have tried to assess whether or not fundamental change has occurred. We have used a process-based approach because a university is a complex organization. Because of this complexity, the first logical step seemed to be breaking up the educational function into its individual processes. We have defined the different processes based on theories from Zairi (1997) and Bulletpoint (1996). Fundamental change in the majority of the processes would suggest the university is evolving in response to the ‘grand social challenges’.

Because universities are receiving public funding, they must account for their activities and achievements to the government and the wider society. Benneworth and Jongbloed (2010) suggest looking at the delivery of improved public goods to stakeholders in this context. We have used their overview of stakeholders of universities (adapted from Burrows, 1999) in order to identify stakeholder that are relevant for universities. We have examined the different stakeholders that have played a role in the changes that have occurred in order to determine whether or not the changes are a response to demands from stakeholders. We have also

looked at the stakeholder salience (the degree to which managers give priority to competing stakeholder claims). Mitchell et al. (1997) have suggested this latter approach. The presence of a lot of stakeholders, with relatively high salience, would suggest the university is evolving in response to the 'grand social challenges'.

We have also explored to what extent another plea, called the interdependent plea, is applicable to a contemporary university. A new plea that explains the university's response to the 'grand social challenges' in terms of more society-driven values would point to evolvment. We have created this plea based on societal changes observed by for example Marshall (1995), Rhodes (1997), Jones *et al.* (1997), and Williamson (1975).

From the research, it has become clear that the University of Twente seems to be starting to respond to the 'grand social challenges'. In some areas fundamental change has occurred. This has been a reaction in response to a wide range of stakeholders' demands. It is not certain, however, where this change is leading, and whether or not it is the start of something new. The economic plea is starting to become less applicable, but there does not seem to be a better plea (yet) to describe contemporary universities either.

Summary in Dutch

Als samenleving hebben we te maken met een aantal ‘grand social challenges’. Deze uitdagingen zijn erg divers. Voorbeelden hiervan zijn: klimaat verandering, het opraken van grondstoffen, duurzame stedenbouw en efficiënte gezondheidszorg van hoge kwaliteit.

Organisaties zullen met deze ‘grand social challenges’ moeten omgaan. Deze uitdagingen worden door Ackoff (1999) gedefinieerd als ‘multi-disciplinary messes’. De definitie die Greenwood (2007) hiervoor geeft maakt duidelijk dat dit het soort problemen zijn waar academici in hun carrière mee te maken krijgen. Dit zijn ook problemen die vanuit verschillende disciplines benaderd zullen moeten worden. De reactie van universiteiten op deze uitdagingen wordt in deze thesis behandeld. Dit gezien de unieke en diverse rollen die universiteiten gedurende de afgelopen eeuwen in onze samenleving hebben gespeeld. De unieke karakteristieken die een universiteit bezit maken dat het interessant is om te onderzoeken hoe deze organisatie met deze uitdagingen omgaat.

Er is niet altijd op de zelfde manier tegen universiteiten aangekeken. Het ‘idee van een universiteit’ is gedurende de afgelopen decennia veranderd (Grit, 2000). Eerst werden universiteiten gezien als ‘klassieke’ instituties waarin kennis bijvoorbeeld werd gezien als product van de menselijke geest. Daarna is de zogenaamde kritieke universiteit ontstaan, waarin kennis een sociaal fenomeen werd. Meer recent is de ondernemende universiteit ontstaan. Hierbij werd kennis gezien als een economisch product. Al deze fasen kunnen aan de hand van verschillende vertoogcoalities geïnterpreteerd worden.

In dit onderzoek is de mogelijkheid van het ontstaan van een nieuw vertoog in reactie op de ‘grand social challenges’ onderzocht. De Universiteit Twente is hierbij als case gebruikt. En binnen deze institutie is het onderwijs onderzocht. Dit is hoofdzakelijk gedaan om het onderzoek beheersbaar te houden.

Door de aard van de veranderingen binnen de verschillende processen te onderzoeken hebben we geprobeerd na te gaan of er fundamentele verandering heeft plaatsgevonden. Er is een proces benadering gebruikt omdat een universiteit een complexe organisatie is. Deze complexiteit maakt dat de eerste logische stap het opdelen van de educatie in verschillende processen was. De verschillende processen zijn geïdentificeerd op basis van theorieën van Zairi (1997) en Bulletpoint (1996). Fundamentele verandering in het merendeel van de processen zou wijzen op ontwikkeling van de universiteit in reactie tot de ‘grand social challenges’.

Omdat universiteiten publiek geld ontvangen, moeten ze hun activiteiten en prestaties verantwoorden aan de overheid en de samenleving. Benneworth en Jongbloed (2010) stellen voor om in deze context te kijken naar the leveren van verbeterde publieke goederen aan stakeholders. We hebben hun overzicht van stakeholders van universiteiten gebruikt (een aangepaste versie van die van Burrows, 1999) om te identificeren welke stakeholders belangrijk zijn voor

universiteiten. De verschillende stakeholders die een rol hebben gespeeld zijn bestudeerd om na te gaan of de veranderingen een antwoord zijn op vragen uit de samenleving (van stakeholders). We hebben ook gekeken naar stakeholder 'saliency' (de mate waarin managers voorrang geven aan claims van bepaalde stakeholders). Deze aanpak is voorgesteld door Mitchell et al. (1997). De invloed van veel stakeholders, met een relatief hoge 'saliency', zou betekenen dat de universiteit zich ontwikkeld heeft in reactie tot de 'grand social challenges'.

We hebben ook onderzocht in welke mate een ander vertoog, namelijk het onderling-afhankelijke vertoog, toepasbaar is een hedendaagse universiteit. Een nieuw vertoog dat de reactie van de universiteit op de 'grand social challenges' op basis van meer maatschappelijk gedreven waarden uitlegt zou wijzen op de ontwikkeling de universiteit. We hebben dit vertoog gecreëerd op basis van veranderingen in de samenleving geobserveerd door onder andere Marshall (1995), Rhodes (1997), Jones *et al.* (1997) en Williamson (1975).

Op basis van het onderzoek is duidelijk geworden dat de Universiteit Twente lijkt te zijn begonnen met veranderen in reactie tot de 'grand social challenges'. Op sommige vlakken heeft fundamentele verandering plaatsgevonden. Dit is gebeurd in reactie op een serie verlangens van stakeholders van de universiteit. Het is echter niet duidelijk waar deze verandering op aanstuurt, en of dit het begin is van iets nieuws. Het economisch vertoog begint minder goed toepasbaar te worden, maar er lijkt (nog) geen vertoog te zijn dat hedendaagse universiteiten beter beschrijft.

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List of Abbreviations

CRE	The association of European universities (The Conference of European Rectors)
CSR	Corporate Social Responsibility
CSTM	Twente Centre for Studies in Technology and Sustainable Development (Centrum voor Schone Technologie en Milieubeleid) [CSTM is part of the University of Twente]
EU	European Union
IMPACT	Institute for Energy and Resources (Originally: Institute of Mechanics, Processes and Control Twente) [IMPACT is part of the University of Twente]
ITC	Faculty of Geo-Information Science and Earth Observation (Originally: International Training Centre for Aerial Survey) [ITC is part of the University of Twente]
NIKOS	Dutch Centre For Knowledge Intensive Entrepreneurship (Nederlands Instituut voor Kennisintensief Ondernemerschap) [NIKOS is part of the University of Twente]
NWO	The Netherlands Organization for Scientific Research (De Nederlandse Organisatie voor Wetenschappelijk Onderzoek)
R&D	Research and Development
SPRINT	Promotional program for innovative scientific and technological education (Stimuleringsprogramma Innovatief Natuurwetenschappelijk en Technisch onderwijs)
UT	University of Twente
VROM	[Ministry of] Housing, Spatial Planning and the Environment ([Ministerie van] Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer)

1. Introduction

1.1. Grand social challenges

As a society we are facing a number of 'grand social challenges'. These challenges are very diverse, examples are: climate change, resource scarcity, urban sustainability, and efficient, high quality health care. We will illustrate the importance of each of these challenges with examples from the European Commission and the United Nations.

Climate change is a critical topic in our society. The European Commission for example states: "Climate change is already happening and represents one of the greatest environmental, social, and economic threats facing the planet (European Commission, 2010a)." The European Union is working aggressively to achieve substantial reductions in its own contribution to this problem and is actively working on a global agreement to control climate change (European Commission, 2010a). Climate change also appears to be an important issue for the United Nations. In 1992, most countries joined an international treaty called the 'United Nations Framework Convention on Climate Change'. These countries joined this treaty in order to try and gain insight into what can be done to reduce global warming and cope with inevitable temperature increases. More recently, some countries incorporated the more powerful 'Kyoto Protocol' as an addition to this framework.

Resource scarcity is also an important issue for the European Commission. The development of renewable energy sources and the reduction of energy consumption are key points in the EU's policy regarding energy (European Commission, 2010b). The European Commission is also taking action to make sustainable and constant energy supplies available to impoverished people around the globe (European Commission, 2010c). The EU has also agreed to reduce oil dependency by stimulating the development of a low-carbon economy where the EU is less vulnerable to fluctuations in oil prices (European Union, 2008). Environmental sustainability is also part of the "millennium development goals". The millennium goals are eight goals the United Nations have set to be achieved by the target date of 2015 (United Nations, n.d.).

Another project the European Commission is involved in, is creating a sustainable 'European city of the future'. In this city, economic growth and urban regeneration should go hand in hand with improving quality of life, promoting effective land use, and the protection of the environment (European Commission, n.d.).

The European Commission is also concerned with the availability of safe, high quality and efficient health services for European citizens (European Commission, 2007). This poses some challenges for the future as well because of demographic changes like an ageing population, the increased risk of pandemics, and the development of new technologies.

These ‘grand social challenges’ are huge and complex problems. These cannot be tackled by one single institution or within one single discipline. Knowledge will have to travel across boundaries of institutions and disciplines. Expert knowledge and public knowledge from both within and outside institutions will have to be used. This only adds to the complexity of dealing with these ‘grand social challenges’. Ackoff (1999) uses the term ‘multi-disciplinary messes’ to describe these kinds of problems. Greenwood (2007, p. 109), defines these ‘multi-disciplinary messes’ as follows:

“These are complex, dynamic, multi-disciplinary problems that have scientific, technical, social scientific and humanistic dimensions ... these are precisely the kinds of problems that graduates of universities will face in their work lives, and that local, regional and national governments consider to be urgent.”

1.2. The entrepreneurial university

Organizations will somehow have to deal with these ‘grand social challenges’. We are particularly interested in the reaction of universities to these challenges because of the unique and diverse roles universities have played in our society throughout the previous centuries (Grit, 2000; Bender, 1988). Universities are no regular organizations. According to Sporn (1996, p. 42), a university is a “complex organization with a unique set of features”. Following Birnbaum (1988) and Baldrige *et al.* (1977), Sporn (1996, p. 42) states that there are certain characteristics that dominate the culture of universities. The fact that universities possess all these characteristics differentiates them from ordinary organizations. These characteristics are summarized in the next paragraph. Bartell (2003, pp. 52-53) gives a similar overview of a university’s characteristics.

First of all, universities have to deal with conflicting goals. Multiple claims are made about what the objectives and standards of teaching should be. Universities are also institutions that are fundamentally “people-orientated”. All “clients” have different wishes, which adds to the cultural diversity within the university and poses a challenge for university management. Moreover, it is difficult to set standards for goal attainment. It has proven to be problematic to develop one satisfactory standard for the delivery of diverse services. Universities also have to deal with the demand for more autonomy and freedom from professionals like professors. Decision-making tends to be quite drawn out due to the involvement of diverse interests of academic and administrative staff. Universities are very exposed to their environments as well. Political, economic, social and technical changes heavily influence the university’s situation, and are likely to play a role when universities plan strategic activities (Sporn, 1996, p. 42). We should however keep in mind that the entire point of a university, and what distinguishes universities from other institutions, is that they can deal with this complexity. It is about trying to let the institution work coherently.

The conception of a ‘university’ can be thought of as being dependent on the forces different plea coalitions exert on them. Because of changes in these forces,

the ‘idea of a university’ tends to change over time. Plea coalitions represent different groups in society with their own ideas about the desired role of universities in society. These plea coalitions make different claims about the tasks a university should carry out and what idea of a university is admirable. In order to achieve their goal, plea coalitions exert pressure on universities. Dependent on the current state of society, a certain plea coalition (group in society) becomes dominant. No single plea has ever succeeded in completely eliminating the other pleas, so it is always a compromise of different coalitions with one coalition being the dominant one (Grit, 2000). Grit (2000, p. 113) has categorized three different ideas of universities¹, each with a different dominant plea coalition. He has summarized the differences as shown in table 1.1.

Table 1.1 Three Pleas: Three ideas of universities

	<i>Cultural plea</i>	<i>Political Plea</i>	<i>Economic Plea</i>
	Classical university	Critical university	Entrepreneurial university
<i>View on knowledge</i>	Product of the human mind	Social phenomenon	Economic commodity
<i>‘Homo academicus’</i>	Scholar	Social activist	Entrepreneur
<i>Social orientation</i>	Cultural role	Political role	Economic role
<i>Pursuing autonomy from:.....</i>	Religion and church	Market and industry	Politics and the government
<i>Control of science</i>	Academic society	Scientific forum or public debate	Professional management and contract research

(Source: Grit, 2000, p. 113)

But what exactly is a university? We have seen that universities have not always looked the same. As shown before, there have been some shifts in their basic role in society. And the nature of society itself has changed as well. Around the end of the millennium, a new kind of society has come into existence. Social, technological, economic, and cultural changes have given rise to a ‘network society’ (Castells, 2010, p. xvii). However, societal change is not something new (Bender, 1988). Universities have for example also had to deal with the rise of the knowledge society, and before that a shift from a feudal society to an urban society (Hobsbawm, 1954), and a shift from a mercantile society to a manufacturing society (Hobsbawm, 1962). The main point here is that universities as social organizations are forced to respond to changes in the nature of society in order to survive.

Denman (2005, p. 19) has tried to give a definition of a university in the 21st century, which is useful here in terms of framing precisely what it is we are talking about.

“A university is a complex higher education organization that is formally authorized to offer and confer advanced degrees in three or more academic disciplines or fields of study (Denman, 2005, p. 19).”

¹ The term ‘idea of a university’ was first coined by Newman (1852) and refers to the idea people have of what a university is, instead of what universities actually look like.

1.3. Problem definition

During the past two centuries, there has been a shift in the way people think about universities. Multiple claims have been made about the tasks a university should carry out, and notably, quite recently a new dominant claim emerged. It started becoming more and more common for universities to be involved in seeking after certain economic and social goals (Grit, 2000, p. 107). The idea of the so-called 'entrepreneurial university' exemplifies this change. In response to external pressures, there has been a shift towards the achievement of particularly these economic goals. When using this idea of a university, knowledge becomes a commodity that can be traded on the market, whilst science and technology should add to the economic position of countries, helping organizations enhance their innovativeness (Grit, 2000, p. 112). This idea of a university also appears to bring with it an increasing openness to stimuli from the market. Also Caruana (1998, p. 56) states that universities are more and more focusing on areas that can generate revenue. It is the question, however, whether or not this 'entrepreneurial university' is sustainable for the future.

A couple of changes are going on in society that will have to be dealt with. As noted before in the introduction to the thesis, climate change, resource scarcity, urban sustainability, and efficient, high quality health care are topics that are getting a lot of attention from for example the European Commission and the United Nations. From all this, it becomes clear that these are real challenges that will probably play an important role in influencing evolution of the 'idea of universities' into the 21st century.

In response to these 'grand social challenges', the basic functions of universities may well change. The contribution to the social-economic well-being of their environment is for example getting more important (Jongbloed *et al.*, 2002, p. 306; Jongbloed, 2007, p. 134). Also Greenwood and Levin (2001, p. 533) think that universities can make significant contributions regarding challenges like these. Universities are among the few centres of knowledge generation and transfer in our society. They have an enormous capacity to solve problems. Universities are the only institutions with this kind of resources that also educate new generations of skilled people. Universities should begin taking these social challenges more seriously in order to prevent more market-responsive institutions from reacting to this opportunity instead (Greenwood & Levin, 2001, p. 533). Jongbloed *et al.* (2002, p. 318) also state that corporate social responsibility (CSR) for universities means contributing to the solving of important problems faced by our society.

A university's ability to react to the 'grand social challenges' seems important. History tells us that universities thrive when they are able to fulfil societal demands, and may 'die' when they do not (Phillipson, 1983). It is not inconceivable that a university's ability to respond to shifting pressures will increasingly influence their ability to attract funds from both governments and other sources in our society. Change is difficult, however, because of the complexity of universities. This raises the question whether or not universities are

able to evolve and meet these demands, or will remain stuck in their current position and run the risk of 'dying'. The following research question has been formed in order to explore this tension:

“Has a new kind of university come into existence in response to new societal pressures?”

In order to answer the research question, we need to answer a number of sub questions. First we need to know whether or not the changes universities have made in reaction to the grand social challenges (if any) are fundamental changes that entail essential functions of the university, or superficial changes that only look good on the outside. So we have to know whether real change has occurred or not. Fundamental change would mean that universities are evolving, and are adapting to the new societal pressures. Superficial change would suggest merely cosmetic change. This lack of substantial change would bring with it the risk of being passed by more market-responsive institutions (Greenwood & Levin, 2001, p. 533) and eventually the risk of dying. The first sub question is thus as follows:

1. “Are the changes in relation to the ‘grand social challenges’ fundamental or superficial changes?”

We also need to know whether or not the changes (if any) are in accordance with stakeholder demands. Furthermore, we should study what stakeholders' demands have been considered when changing the organization. Based on this, we can assess in what way universities are reacting to the 'grand social challenges'. Global warming, for example, is a much-discussed issue in our modern society (t Mannelje, 2007, p. 50). This suggests the involvement of very diverse parties. We assume that the involvement of a diverse set of stakeholders in a university's decision-making process regarding the 'grand social challenges' (i.e. taking into regard the full scope of the problem) suggests universities are indeed evolving in response to these challenges. Whereas sticking to a few (traditional) stakeholders is likely to be a precursor to the decline of the university as an institution due to an inadequate response to the 'grand social challenges'. The second sub question is thus as follows:

2. “What stakeholders have to be considered when reacting to the ‘grand social challenges’?”

A final issue that we have to look in to in order to answer the research question is whether or not the changes made by universities (if any) can be explained from the economic plea (Grit, 2000). If this were the case, this would suggest universities are sticking to old values, and run the risk of dying. A new plea that explains the university's response to the 'grand social challenges' in terms of more society-driven values would point to evolvment. The third sub question is thus as follows:

3. “Can the changes in response to the grand social challenges be explained from the economic plea?”

Three indicators have been formulated that could either point to universities evolving in response to the ‘grand social challenges’ or to an eminent risk of the decline of the university as an institution because of an inadequate response to these challenges (Greenwood & Levin, 2001, p. 533). If the general trend observed from these indicators points to evolvment, this suggests the emergence of a new kind of university in response to new societal pressures.

2. Literature Review

In this section we discuss the literatures that we will use to answer the research question. There are different kinds of theories available to look at organizations (institutional theory, governance theory, and process theory). It is difficult to observe change in an organization as complex as a university, so looking the different processes should allow us to better understand what is going on. This is why we have chosen to use the process-based approach to answer the first sub question.

We will use stakeholder theory to answer the next sub question. We are after all looking at the different parties involved, and this theory should help determining who these parties are and how important they are for the changes observed. Based on this, we will assess to what extent the changes made are in line with demands from society.

In order to answer the last sub question, we will use the theory of the network organization. We will use this theory in order to assess to what extent the ideas described in this theory (ideas based on current changes in the business of government) are applicable to contemporary universities. After all, a university operating from a new plea would point to change.

The combination of these theories is unique to this research. We have chosen this combination to try and cover the full extent of the changes going on in contemporary universities.

2.1. Changes

To keep the researched focused, we will only research the educational function of universities. We should however keep in mind that the point of a university is to bring research and education together. This is what distinguishes universities from for example polytechnic institutions. Based on the interconnectedness between education and research we assume that conclusions drawn about the educational function of universities have the possibility to be valid for the research function, and the institution as a whole as well.

In order to answer the first sub question, we need to know how organizational change can be observed. Different kinds of theory are available to look at organizations, for example: Institutional theory (a theory in which “institutional rules function as myths which organizations incorporate (Meyer & Rowan, 1977)”), governance theory (a theory in which “boundaries between and within public and private sectors have become blurred (Stoker, 2002)”), and process theory. A university is a complex organization, so the first logical step is likely to be breaking it up into individual processes. The process-based approach can be used to do this. What we are trying to do is making sense of a complicated situation, and that is exactly what separately studying the different processes allows us to do. This theory also allows for the comparison with other businesses

because these are also dividable into processes. Since only the educational function of universities is researched, we will only examine the processes relevant for education. Closer examination of each of the processes should help identify the nature of change within these processes.

But what is a process? According to Zairi (1997, p. 64) “A process is an approach for converting inputs into outputs. It is the way in which all the resources of an organization are used in a reliable, repeatable and consistent way to achieve its goals.” Following Buletpoint (1996), Zairi (1997, p. 64) lists four key features to a process:

- Predictable and definable inputs.
- A linear, logical sequence or flow.
- A set of clearly definable tasks or activities.
- A predictable and desired outcome or result.

Based on this definition of a ‘process’, we are going to break up the educational function into a flow of clearly definable processes. Education has the following purposes: “Prepare us, either by general or vocational training, to earn our bread; it should give us some understanding of the universe and of men; and it should help us to become fully developed human beings (Livingstone, 1953)”. In order to be able to reach these goals, universities first have to decide what the training to accomplish this will look like. After all, it is impossible to teach a course when it is not clear what the purpose and contents of a course are. Universities will also have to inform people about this course, people are not interested in funding a course when they do not know what it is about and what the value of the course is. After universities have developed a course and created awareness, it is time to start attracting funds in order to finance the course. Once there is an actual course, and universities have taken care of financing, universities will have to attract students to attend the course. As soon as a university has attracted students, they will have to teach the course. It is after all the purpose of a new course to provide students with the knowledge needed to reach Livingstone’s (1953) goals. By applying the definition of a ‘process’ to this rationale of the teaching process based on Livingstone’s (1953) description of education, we have distinguished the following processes within the educational function of a university:

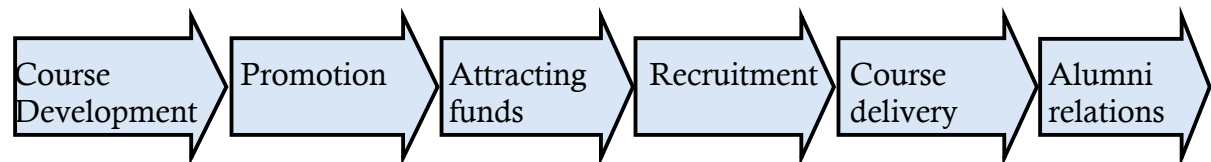
- Course development
- Promotion
- Attracting funds
- Recruitment
- Course delivery

As we will show later, alumni relations are getting more and more important for European universities. That is why we will also research this process within the educational function. So the last process is:

- Alumni relations

These processes occur in a more or less sequential manner. However, the beginning of the next process does not necessarily mean the end of the previous process (for example the promotional activity also continues when funds have been attracted). For the sake of simplicity however, we have created the following model in order to show the different processes:

Figure 2.1. Processes within the educational process (stylised model)



We will discuss each of these processes more extensively in section 2.3, where we deal with the first sub question. We will also identify important (potential) external stakeholders because of the important role they might play in changing the processes. These stakeholders will also be relevant when addressing the second sub question in section 2.4. In order to be able to identify these stakeholders, we will examine the significance of this term more closely in section 2.2.

2.2. The stakeholder approach

Because universities are receiving public funding, they must account for their activities and achievements to the government and the wider society. The “social dividend” universities have to generate comes through the delivery of improved public goods to stakeholders (Benneworth & Jongbloed, 2010, p. 569). Universities, however, have also been undergoing privatisation and liberalisation. They are combining their public tasks with private undertakings and are tied up in a dynamic network of stakeholders. They have to earn their social legitimacy through the ways in which various communities in the society they serve accept and evaluate their services (Jongbloed, 2007, p. 135). One of the economic expectations stakeholders place on universities is the knowledge and skill needs of workers in modern knowledge-based economies (Jongbloed *et al.*, 2002, p. 304).

Following Cohen *et al.* (2002), Jongbloed *et al.* (2002, p. 314) also state that: “University graduates and staff are still regarded as the prime and most effective technology transfer mechanism. The number, quantity, and level of the graduates working in a particular firm of branch of industry heavily determine the intensity and effectiveness of the knowledge flows between universities and research-oriented firms.” From this it becomes clear that businesses have become an important stakeholder of universities. Brennan (2007) also argues that stakeholders other than the government have become more and more important for universities. However, the state still plays an important role for universities (Jongbloed *et al.*, 2002, p. 314). State supervision always stays in place to help guarantee that the universities do not ignore their public tasks (Jongbloed, 2007, p. 135).

Universities are thus getting more and more dependent on different stakeholders for obtaining resources (Benneworth & Jongbloed, 2010, p. 569). But what exactly are stakeholders? The stakeholder approach emerged in 1984 with the publication of Freeman's *Strategic Management: "A Stakeholder Approach"*. The management of stakeholder began when managers started to be faced by unprecedented levels of environmental turbulence and change. The purpose of stakeholder management is to manage all the groups and relationships that emerged in a strategic fashion (Freeman & McVea, 2001, pp. 189-190). Ackoff (1981, p. 30) defines stakeholders as follows: "All those inside or outside the organization who are directly affected by what it does". Stakeholders are not just recipients of benefits, but may demand some degree of involvement in the organization's running in order to improve the value of their share and benefits (Benneworth & Jongbloed, 2010, p. 539).

Benneworth and Jongbloed (2010, p. 570) have given an overview of the stakeholders of a typical higher education institution (Table 2.1). This overview should help when identifying the stakeholders that are important within the different processes.

Table 2.1 Stakeholder categories and constitutive groups

Stakeholder category	Constitutive groups, communities
Governing entities	State & federal government; governing board; board of trustees, buffer organisations; sponsoring religious organisations
Administration	President (vice-chancellor); senior administrators
Employees	Faculty; administrative staff; support staff
Clienteles	Students; parents/spouses; tuition reimbursement providers; service partners; employers; field placement sites...
Suppliers	Secondary education providers; alumni; other colleges and universities; food purveyors; insurance companies; utilities; contracted services
Competitors	Direct: private and public providers of post-secondary education Potential: distance providers; new ventures Substitutes: employer-sponsored training programmes
Donors	Individuals (includes trustees, friends, parents, alumni, employees, industry, research councils, foundations, ...)
Communities	Neighbours; school systems; social services; chambers of commerce; special interest groups...
Government regulators	Ministry of Education; buffer organisations; state & federal financial aid agencies; research councils; federal research support; tax authorities; social security; Patent Office
Non-governmental regulators	Foundations; institutional and programmatic accrediting bodies; professional associations; church sponsors
Financial intermediaries	Banks; fund managers; analysts
Joint venture partners	Alliances & consortia; corporate co-sponsors of research and educational services

(Source: After Burrows (1999, p. 9) by Benneworth and Jongbloed (2010, p. 570))

2.3. Nature of change

We will discuss the different stages of the educational process that we have identified in section 2.1 in sections 2.3.1 through 2.3.6. This will result in the creation of a framework in section 2.3.7. We will also identify stakeholders that are important in the different processes. Closer examination of each of these processes should help to determine whether or not fundamental change has occurred in response to the 'grand social challenges'.

2.3.1. Course development

First, the teaching staff needs to develop a course and university management needs to approve this course in order to be added to the curriculum. In order to

determine whether the development of a course has changed in a meaningful way, it is useful to assess whether the criteria for adding a course to the curriculum have changed. After all, new criteria will influence the way courses are developed. Lo and Sculli (1996, p. 17) state that: “As we are dealing with an educational programme, the objectives should be practical in nature (fit adequately within the time frame available) and should generally be in line with those of the authoritative bodies. The objectives should also be able to satisfy any special needs of local industry, perceived or otherwise.” This suggests that universities typically take into account preferences from important stakeholders, like governments and the industry, when setting criteria for adding a course. If universities have actually altered their course development in response to ‘grand social challenges’, it would show in the change of these criteria. If change has occurred, criteria related to ‘grand social challenges’ would be added or considered more important.

Important external stakeholders in this stage are thus the government and the industry (Lo & Sculli, 1996, p. 17). Students could also play an important role when the criteria for course development are set. The University of Twente for example uses course evaluation procedures to monitor the students’ response to courses (University of Twente, n.d.(a)). This information can be used for the development of new courses.

2.3.2. Promotion

After a university has developed and approved a course, a university needs to engage in the process of promotion. This is an important aspect of a university’s marketing effort. But what exactly is marketing? According to Blythe (2006, p. 5), a commonly quoted definition of marketing that is given by the American Marketing Association is:

“Marketing is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods and services to create exchange and satisfy individual and organizational objectives.”

Traditionally, four activities can be distinguished within the marketing process (Blythe, 2006, p. 13). These are: product, price, place and promotion. The “product” activity of the marketing mix has already been dealt with in the “Course development” section. In this section, we are (as stated before) particularly interested in the process of promotion. This encompasses the communication activities of marketing (Blythe, 2006, p. 14). If only the promotional process has changed in relation to the ‘grand social challenges’, the changes the university has gone through would be merely superficial. However, if these changes are in accordance with for example the changes in criteria for course development and course delivery (provided there has been relevant change in these processes), fundamental change has occurred.

External stakeholders that are relevant in this stage are the government and the industry. These are broadly the same categories that will be identified to be important in the next stage. Promotion at this stage is mainly aimed at general

communications enhancing the legitimacy of the course in society. We will deal with communications towards students later on.

2.3.3. Attracting funds

After a university has informed people about a course, a university needs to attract funding in order to pay for the course. Universities derive income from three so-called flows of funds. In addition to this, they also receive money in the form of tuition fees paid by students. The first flow of funds consists of block grants. These are allocated in proportion to teaching, research and related activities to institutions. This first flow represents the core funding of universities and is, in the Netherlands, supplied by the Ministry of Education, Science and Culture (OCW). Universities decide for themselves how to distribute this money across teaching and research. Projects-based public payments for research represent the second flow of funds. This flow mainly contains grants for individual researchers. The third flow of funds consists of contract research and contract teaching. These activities are carried out for: government organisations (especially ministries), non-profit organisations, private companies, charitable boards, and (increasingly) the European Community. This is also an important source of income for universities, because it constitutes 20% of the income for teaching and research (Weert & Boezeroy, 2007, pp. 44-45).

The first flow of funds has a “research” component and a “teaching” component (Weert & Boezeroy, 2007, pp. 45-46). Because this research focuses only on the education of universities, we will only discuss the teaching component. In the Netherlands, this component has the following parts:

- Fixed amounts for each university (i.e. a basic allocation, with a historical base)
- Diploma-based allocation (number of degrees awarded)
- New entrants allocation
- Allocation for facilities related to training in veterinary sciences and dentistry.

(Weert & Boezeroy, 2007, p. 46)

As becomes clear from this, a university can not directly influence funding from the teaching component of this flow by altering its funding policies. Funding is dependent on the number of students, and we will deal with this issue with in the “recruitment” part of this chapter. We will have to look at the other flows of funds. The second flow is only applicable to individual research projects, and thus not relevant for the education of universities. This leaves the third flow. Here, universities have to attract funds from governmental bodies and at the market. It is very likely that engaging in activities that any of these parties consider important can positively influence a university’s ability to attract funds from this third flow. It is worth exploring whether or not universities perceive pressure from any of these resource providers to engage in any activity related to the ‘grand social challenges’, and how universities are responding to this perceived pressure. If universities have changed their funding process in response to the ‘grand social challenges’, we would expect changing activities in response to these

perceived pressures (related to the ‘grand social challenges’) from providers of funding and an emphasis on these activities in communications towards these parties.

It is important to already note at this stage that the government is currently redistributing money among universities. The best researchers will for example receive more money than they did before. People within the university that do not do research (and are more involved in the educational function) tend to lose money. The people that are getting more money want to use it for the research based on which the money was granted instead of giving it to people that have been getting less money. This way, the awarded money usually is not spent on education (Interview 1, 2010). Because of this close connection between funding of education and research, we will also take into account some parts of research funding that are closely linked to education.

Important external stakeholders are thus: the government, organisations / private companies, non- profit organisations, charitable boards, and the European Community (Weert & Boezeroy, 2007, pp. 44-45).

2.3.4. Recruitment

When a university has arranged the funding of a course, the recruitment process can start. Following Cheng and Tam (1997), Elliot and Healy (2001, p. 2) state that: “higher education is increasingly recognizing that it is a service industry and is placing greater emphasis on meeting the expectations and needs of students”. Universities have to identify and meet student expectations in order to be able to attract students (Elliott & Healy, 2001, p. 1). Universities should assess what dimensions of university life their potential students consider most important. The question that we have to answer is thus as follows: “Do universities perceive pressure from students to engage in any activity related to the ‘grand social challenges’, and how are universities responding to this perceived pressure?” If universities have changed their recruitment process in response to the ‘grand social challenges’, we would expect changing activities in response to these perceived pressures from potential students and an emphasis on these activities in communications towards potential students.

The external stakeholders that are important at this stage are thus (potential) students.

2.3.5. Course delivery

After a university has attracted the students, the university has to teach the course. Teaching encompasses “a contract between a student and a teacher (Lott, 2008)”. It is, however, not certain the formal course description formed when developing and approving the course truly represents the information and instructions that teachers give to students during this contact. The next question that we have to answer in order to assess to what extent the education at universities has changed in response to the ‘grand social challenges’ is thus as

follows: “Have universities really changed the contents of their courses in response to changing approval criteria?” If change has really occurred, we would expect the formal course description to accurately represent a course’s contents regarding the ‘grand social challenges’.

No new external stakeholders are introduced in this stage. The question here is only whether or not the course has changed in accordance with ‘promises’ the university made before.

2.3.6. Alumni relations

Dutch universities are receiving increasingly smaller amounts of money from governments (Trouw, 2010). They are more and more dependent upon our civil society for funding. Alumni associations appear to be getting more popular in the Netherlands because of this trend. But what exactly do alumni associations do? According to Dolbert (2002), they are responsible for the following tasks:

- Identifying and tracking of alumni.
- Informing alumni regularly about the alma mater and keeping them “attached” to it.
- Developing or increasing interest in the alma mater both through communications and programming.
- Involving alumni in the life of the university, whenever and wherever possible.
- Providing meaningful opportunities for alumni to give back – to invest in future alumni or in the future of the institution.

The main question here is whether or not the ‘grand social challenges’ are getting more important in any of these tasks. If this were the case, this would point to an increasing emphasis on these ‘grand social challenges’ in alumni relations. Particularly because universities appear to be getting more dependent on alumni associations, this is an important process to research.

The external stakeholders that are central in this stage are thus alumni.

2.3.7. Framework

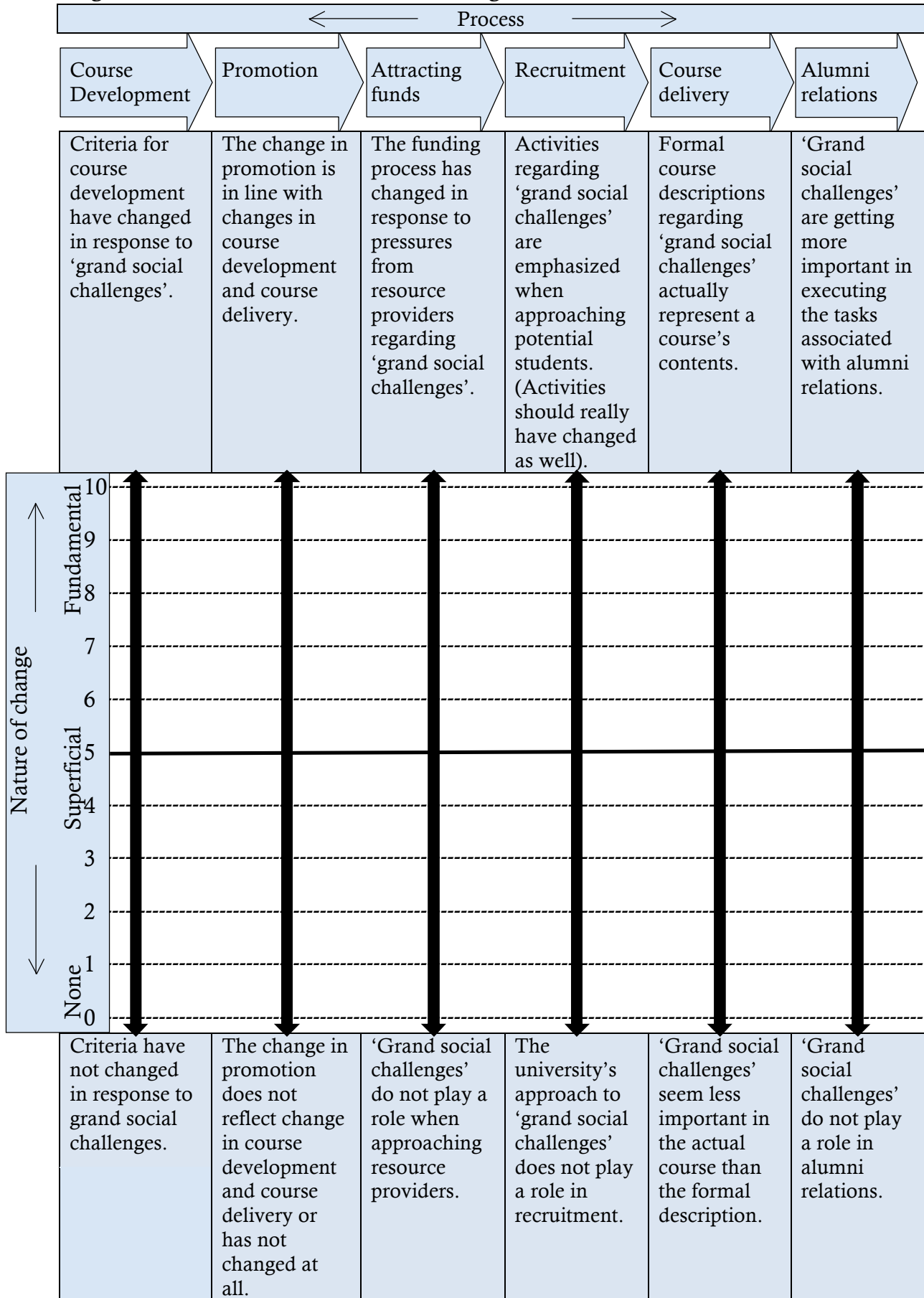
In order to assess whether a change is more likely to be fundamental or superficial in nature, we should distinguish between changes that are relatively easy to introduce and undo and changes that are more structural. When only the process of promotion has changed, and this change is not in line with changes to course development and course delivery, change is likely to be to be superficial. Alternatively, structural change in the promotional process would entail changes that are in line with changes in the course delivery and course development processes. Another example of superficial change would be when not the funding and recruitment processes have changed, but only the communications towards funding organizations and students. Changes to course development and course delivery tend to be more structural, so changes in these processes suggest more

fundamental change. After all, teaching is one of the core functions of universities (Jongbloed *et al.*, 2002), and promotion is not.

The same is true for the “alumni relations” process. Change in the underlying processes suggests a more fundamental change, and merely change in communications suggests superficial change.

Figure 2.2 gives an overview of the criteria used to determine whether change (if any) is fundamental or superficial. In this research, we score the scope of the changes at each stage of the process against these criteria. Our heuristic here is of a balanced scorecard: the more processes tend to have changed fundamentally, the more likely it is that universities are evolving positively in response to the ‘grand societal challenges’. This allows us to answer sub-question 1.

Figure 2.2. Criteria for the nature of change



2.4. Stakeholders in the educational process

In section 1.3 we surmised that the more the stakeholder demands regarding the ‘grand social challenges’ are taken into account, the more the university is adapting to these challenges. The extent to which universities take these demands into account has two dimensions. The number of stakeholders considered, and the significance of these stakeholders for the university when making decisions. In order to determine this significance, Jongbloed *et al.* (2002, p. 308) suggest to use the approach of Mitchell *et al.* (1997) to help and identify “who or what really counts”. Mitchell *et al.* (1997) developed the theory of *stakeholder salience* in order to explain the degree to which organizations give priority to competing stakeholder claims. Three attributes of stakeholders can be distinguished (Mitchell *et al.*, 1997, p. 869):

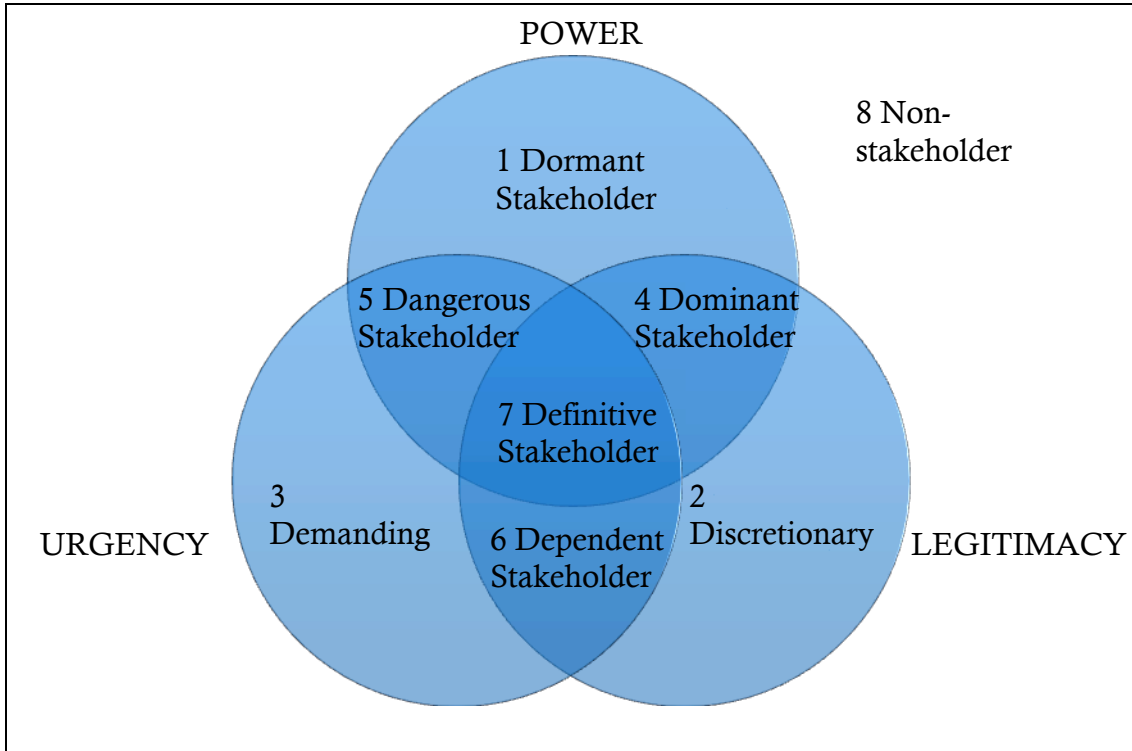
Stakeholder power: “A relationship among social actors in which one social actor, A, can get another social actor, B, to do something that B would not have otherwise done.”

Stakeholder legitimacy: “A generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, definitions.”

Stakeholder urgency: “The degree to which stakeholder claims call for immediate attention.”

Different classes of stakeholders can be distinguished based on the possession of one, two, or three of these attributes. Figure 2.3 (Mitchell *et al.*, 1997, p. 874) shows the different degrees of salience stakeholders may possess (The degree to which managers give priority to competing stakeholder claims).

Figure 2.3 Stakeholder Typology: One, Two, or Three Attributes present



(Source: Mitchell et al., 1997, p. 874)

There are seven different classes of stakeholders (figure 2.1). These can be divided into three different groups. The first group are the latent stakeholders (classes 1,2,3), and only possess one attribute. The second group are the expectant stakeholders (classes 4,5,6). They possess two attributes. The third group are the definitive stakeholders, which possess all three attributes (Mitchell *et al.*, 1997). A particular stakeholder can however move from one class to another by gaining or losing particular attributes (Jongbloed *et al.*, 2002, p. 310). It is also likely to differ from university to university which stakeholders can be considered definitive stakeholders.

Governments are always definitive stakeholders for universities. Businesses are also moving toward the definitive stakeholder status. The new knowledge-driven economy has added the attribute urgency to the other attributes they already possessed (Jongbloed *et al.*, pp. 310-311). By declaring particular social issues of national significance and mandating universities to address those issues, these issues have become urgent (Benneworth & Jongbloed, 2010, p. 572). Which kind of businesses and other institutions are definitive, expectant or latent stakeholders (i.e. possess one, two, or all three attributes) will have to be determined based on closer examination of the institution that will be researched.

In section 2.3, we have already identified the stakeholders that we will examine more closely because of their relevance for the educational process within universities. Table 2.2 gives an overview of these stakeholders.

Table 2.2. Processes with their relevant stakeholders

Process	Stakeholders
Course development	The government
	The industry
	Students
Promotion	The government
	The industry
Attracting funds	The government
	Organizations / private companies
	Non- profit organizations
	Charitable board
Recruitment	European community
	(Potential) students
Course delivery	-
Alumni relations	Alumni

2.5. Universities in terms of pleas

Universities have always been changing. The first university was created within a decade of the year 1200. In the subsequent eight centuries, there have been important changes in the idea of a university. The most notable change was the incorporation of the research ideal and the adoption of a bureaucratic style (Bender, 1988, p. 4). Throughout the centuries, universities have had to deal with even more change, but no institution in the West has persisted longer. The university's special relation to society has enabled universities to survive throughout all the episodes of change (Bender, 1988, p. 4). This has also been the case with the recent changes in dominant pleas, and the corresponding 'ideas of a university'. Universities have always been able to adapt in response to changes in society.

This brings us to the changes currently going on in society. Marshall (1995, p. 291) states that the sectorial boundaries are breaking down and that a variety of disparate interests are getting more and more involved in higher education. Rhodes (1997) also states that a shift from government to governance is taking place. Governments used to be able to set the rules everyone had to obey. However, a variety of stakeholders have been getting more power. This means that old models of government are getting obsolete, and new models of governance in which governments set expectations and grant power are replacing old models. From the previous section (2.4) it has also become clear that different stakeholders are increasingly important for universities.

There has thus been a change in the way that the business of governments is done. There has been a shift from hierarchies to networks and markets. The 'paradigm' of a government in a network could be used to think of what a university might look like.

'Grand social challenges' are exactly the kind of challenges that have to be dealt with in networks. This becomes clear from Greenwood's (2007) definition of

multidisciplinary masses. Multidisciplinary masses are "complex, dynamic, multi-disciplinary problems that have scientific, technical, social scientific and humanistic dimensions". Because of the multitude of dimensions, it is unlikely that one single organization can deal with these problems. A university's ability to contribute to solving these problems seems important in order to sustain its special relation to society. The increasing involvement of different stakeholder contributes to the urgency of reacting to these challenges. Universities will thus have to adapt in response to changes in society. In other words: Universities are more likely to survive when they move towards networks.

This idea of 'universities in networks' is in line with the idea of Network Governance. This idea originates from the term "network organization" coined by Miles & Snow (1986), and has since then been discussed frequently in management literature (Jones *et al.*, 1997). Based on the different terms used to describe Network Governance, Jones *et al.* (1997, p. 914) propose the following definition:

"Network governance involves a select, persistent, and structured set of autonomous firms (as well as non-profit agencies) engaged in creating products or services based on implicit and open-ended contracts to adapt to environmental contingencies and to coordinate and safeguard exchanges. These contracts are socially- not legally-binding."

This definition is in line with the idea that Network Governance can be seen as an alternative to markets and hierarchies (Williamson, 1975). This definition also takes into account the interconnectedness of the different stakeholders involved. Because of this, this literature seems particularly useful for this research.

Based on the idea of a network organization, we have created a fourth plea. This plea is described in table 2.1.

Table 2.1. The fourth plea

	<i>Economic Plea</i>	<i>Interdependent Plea</i>
	Entrepreneurial university	Networked university
<i>View on knowledge</i>	Economic commodity	Resource that can be exchanged in a network of stakeholders. Not always in return for money.
<i>'Homo academicus'</i>	Entrepreneur	Actor acting on behalf of the community (university) in a network of stakeholders
<i>Social orientation</i>	Economic role	Promoter of the interests of the network as a whole.
<i>Pursuing autonomy from:.....</i>	Politics and the government	Communities outside the network
<i>Control of science</i>	Professional management and contract research	Agreement within the network

The next step is finding out which plea most accurately describes universities' current operations. So the question is whether or not there is a new plea that is leading to the creation of a new form of university. If universities are still operating from the entrepreneurial plea, the underlying assumption is that universities should aim at maximizing the return of the university as a whole. This could jeopardize a university's ability to react to the grand social challenges because they run the risk of being surpassed by more market-responsive institutions (Greenwood & Levin, 2001, p. 533).

If universities are starting to operate from the 'interdependent plea', the underlying assumption would be that maximizing the system return is more important than maximizing the return for the university itself. A shift in *Zeitgeist* would have occurred, and a new dominant plea would have emerged. Universities operating from this plea are better able to already start responding to the 'grand social challenges'. After all, "effective network governance means building structures that are responsive to both internal and external legitimacy needs" (Provan & Kenis, 2007). A shift towards this plea would mean universities are evolving.

3. Methodology

There are different ways of doing research. It is for example possible to draw conclusions from a representative sample of the entire population. This is a particularly useful approach when the aim is drawing conclusions that are generalizable to the rest of the population. Another approach is the use of a case study. A study like this cannot be used to draw conclusions for the entire population, but it can for example be used to disprove a hypothesis. Because of the exploratory nature of this research, it is justified to look at just one case. Changes observed in only one case are already interesting at this stage. A case study aims at studying the particularity and complexity of a single case. The goal is to understand its activity within important circumstances. Because we are only looking at one case, we have chosen to research a case that is of special interest given the topic. Stake (1995, p. xi) has suggested to use this criterion for the selection of a case. The case we are studying is the University of Twente. Although the University of Twente is not the only university that has transformed into an 'entrepreneurial university', the University of Twente is a good example of this 'idea of a university' (Grit, 2000, p. 104; Clark, 1998). It is important to research a university that has clearly been operating from the economic plea, because we are interested in a shift away from this plea. This is best observed when one can compare the current situation with a clear example of the economic plea in practice. Another advantage of studying the University of Twente is the ease of access to information as a student of this institution.

After careful examination of the description of each bachelor curriculum on the information site of the University of Twente (University of Twente, n.d.(b)), we have found that especially the study called 'Advanced Technology' pays special attention to 'tomorrow's problems'. Cleaner Energy is one of the problems mentioned in the study description (University of Twente, n.d.(c)). Because it is important to look at a study that teaches courses in a field that is generally thought of as relevant in the tackling of the 'grand social challenges', and the study called 'Advanced Technology' is such a study according to the course description, we have chosen to focus on teaching activities within this curriculum when researching the university's response to the 'grand social challenges'. A study like this is likely to be one of the first places to be able to observe change. We have asked members of the teaching staff from within this study to participate in the research. We have also asked people from the university management that were relevant for the study 'Advanced Technology' to participate, alongside people involved in alumni relations.

We have created an interview guide in order to structure the interview. An interview guide consists of groupings of topics and questions that the interviewer can ask in different ways to different participants (Lindlof & Taylor, 2002, p. 195). The interviews in this research were semi-structured. This interview format gives the freedom to ask optional questions or to go down an unexpected conversational path (Lindlof & Taylor, 2002, p. 195). We have chosen this approach because of the exploratory nature of this research. All relevant questions that could be asked are not known, and because of this it makes sense

to leave room to ask questions that come up during the conduction of the interview and allow interviewees to discuss topics that we hadn't thought of beforehand. The goal of the research was not to grade interviewees in a way that is comparable over multiple cases, but to gather as much relevant information as possible.

We wanted to gather evidence to answer the following three questions:

1. **“Are the changes in relation to the ‘grand social challenges’ fundamental or superficial changes?”**
2. **“What stakeholders have to be considered when reacting to the ‘grand social challenges’?”**
3. **“Can the changes in response to the grand social challenges be explained from the economic plea?”**

Based on the answers of to these questions, the research question has been answered as well.

“Has a new kind of university come into existence in response to new societal pressures?”

3.1. Nature of changes

In order to determine to what extent each of the processes that we have identified has changed in response to the ‘grand social challenges’, we have interviewed parties that are relevant within these processes about the university’s response to the ‘grand social challenges’ with regard to these processes. We have used the topics in section A of the interview guide to interview these parties about the changes within each of the processes. Parties that seem relevant within the different processes, and have thus been approached to be interviewed, are shown in table 3.1.

Table 3.1. Relevant parties per process

Process	Relevant party/parties
Course development	Teaching staff
	University management
Promotion	University management
Attracting funds	University management
Recruitment	University management
Course delivery	Teaching staff
Alumni relations	University management
	Alumni office

We have surmised that the teaching staff is particularly relevant in the course development and course delivery processes. The other processes are largely beyond the control and sight of the teaching staff. We assume the university

management is particularly relevant in all processes except the actual course delivery because this processes happens largely out of sight for this party. The alumni office seems relevant for the alumni relations. We have also asked all respondents whether they were able to tell something about processes of which they were no information holders. We have done this in order to get a complete picture of the changes going on.

In addition to this, we have also interviewed one of the members of Werkgroep UTduurzaam, an independent group promoting sustainability at the University of Twente. During one of the other interviews, one of the interviewees pointed out that this group could provide some valuable insights into to matter at hand (Mulder, Interview, 2010). This is why we contacted them for an interview as well.

Based on the results of the interviews, we have determined whether or not fundamental change has occurred in each of the processes. We have also assessed changes in promotional activities, and communications towards resource providers, students, and alumni. This assessment was based on careful examination of these activities (e.g. some of the university's promotional material).

In order to determine the nature of change, we have used a triangulation method. First, we have gathered all evidence suggesting change has occurred. Subsequently, we have gathered all evidence suggesting no change has occurred. Thereafter, we have weighed all the evidence (based on the number of pieces of evidence suggesting either change or no change, and the expected relevance of these pieces of evidence), and come to a general conclusion in the sections 4.x.3. We have assessed all the evidence as objectively as possible, and based on this assessment, we have drawn conclusions.

3.2. Stakeholders in the educational process

In order to determine the number of stakeholders considered when dealing with the 'grand social challenges', we have also used section A of the interview protocol to find out which stakeholders have been considered in each of the processes. We have assessed the significance of the different stakeholders for the university when responding to the 'grand social challenges' as well. We have based this assessment on the topics in section B of the interview protocol. Based on the stories told by each interviewee, we have tried to rate each stakeholder relevant for each of the processes that we have identified in section 2.1 and 2.2 on their degree of salience. In section 2.4 we have already determined the attributes used in this rating. These attributes are again shown in figure 3.1.

Figure 3.1. Stakeholder Attributes

Stakeholder power:	“A relationship among social actors in which one social actor, A, can get another social actor, B, to do something that B would not have otherwise done.”
Stakeholder legitimacy:	“A generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, definitions.”
Stakeholder urgency:	“The degree to which stakeholder claims call for immediate attention.”

3.3. Universities in terms of pleas

In order to determine what plea most accurately describes the current ‘idea of a university’ within the University of Twente, we have assessed which of the statements in section C most accurately describes the story told by the respondents. These statements are all corresponding to one of the five characteristics Grit (2000) uses to describe the different pleas. For every topic (characteristic), there is a statement that describes the ‘economic plea’ and one that describes the ‘interdependent plea’. Based on this, we have tried to determine whether the general trend tends towards the ‘economic plea’ or towards the ‘interdependent plea’. These pleas have been described in section 2.5.

Here again, we have used a triangulation method. We have shown the evidence we collected for both pleas, and based on all the evidence (taking into account the number of pieces of evidence, and the expected relevance) we have drawn a conclusion.

3.4. The Case

We have determined that the case of the University of Twente will be studied in this research. In order to do this, it is good to know some more about this university. First, we will provide some factual information from the website of University of Twente:

“The University of Twente is a research university which focuses on the development of technology and its impact on people and society. This focus can be seen in the range of 22 Bachelor's degree programmes and 31 Master's degree programmes which the university offers in the field of technology and behavioural and social sciences. There are 5,500 Bachelor's degree students and 2,500 Master's degree students at the University of Twente (University of Twente, n.d.(e)).”

In addition to this factual information, we also provide a shortened version of a more detailed description given by Benneworth, Charles, and Madanipour (2010):

“The University of Twente is a campus university built on a country estate just outside the city of Enschede in the Netherlands. The university was founded in 1961 in response to severe regional economic problems as a result of textiles’ decline. In 1984, the University of Twente began its spin-off programme, which produced over 700 companies to date employing over 5000 in the Twente region.

There were two factors that attracted regional partners to participate in “shared” activities with the University of Twente. The science park was very clearly a successful economic development project, hinting at the university’s further untapped economic development potential. From the late 1990s, the university promoted the idea of a Twente Knowledge Park, extending the science park westwards for a further 100 ha, to create a hub with a critical mass of regional high-technology activities. The university initiated this development to provide resources for the modernization of its own campus. The Knowledge Park concept caught the eye of two separate actors who incorporated it into their own development policies, instrumental to the plan’s success.

The presence of the university helped to attract a number of high-technology firms who wanted to recruit UT graduates and work with UT spin-offs. These large firms such as Lucent, Logica and Ericsson in turn commissioned flagship premises, and although some businesses downsized or closed after 2001, those buildings still remain. The real innovation in the Business and Science Park is that it represents a new central knowledge district for the city region of Twente, supporting not just the Enschede economy, but is also critical in supporting knowledge-intensive businesses across the Twente city region. (Benneworth, Charles & Madanipour, 2010, shortened by author)”

From this description, it becomes clear that the University of Twente is/was to a large extent involved with (local) businesses.

4. Nature of change

We have been able to interview people from both within university management (also relevant for alumni), and from the teaching staff. During one of the interviews it was pointed out that the “Werkgroep UTduurzaam” could also provide some meaningful insight (Mulder, Interview, 2010), so we approached them for an interview as well. In total, eight interviews were held.

We have determined the extent to which each of the processes has changed based on careful examination of the transcripts from the interviews and other relevant sources. This has resulted in an assessed score of 0 to 10. 0 would suggest no change, 5 would suggest merely superficial change, and 10 would suggest fundamental change. Based on this, we have filled out the framework created in section 2.2. The filled out framework is shown in section 4.7.

4.1. Course development

It has become clear that the university - and specific courses considered here - is starting to react to ‘grand social challenges’. The university has started offering new curricula in response to societal demands and changes. Some existing (technical) courses have also changed with regard to the examples used within the courses. Moreover, the scientific staff is offering interesting projects that are somehow related to the ‘grand social challenges’, and students are willing to work on these projects, which suggests an increasing interest in these topics by students and staff. There has been an increasing awareness that social pressures will influence more courses as well. The fact that groups like Werkgroep UTduurzaam are emerging and their opinion is seriously considered when developing curricula also suggests the university is starting to react to the ‘grand social challenges’.

However, most traditional technical and especially non-technical curricula have not changed much in reaction to these challenges. In several interviews it was also mentioned that universities are receiving less money than before, which might threaten the university’s ability to react to the ‘grand social challenges’

4.1.1. Evidence suggesting fundamental change

In one of the interviews it was pointed out that the process of developing individual courses has not changed in response to societal pressures. The criteria have remained the same (Interview 7, 2010). Another interviewee agrees that the process for developing a new course has remained more or less the same with regard to these societal pressures, but stresses that there has been a change in curricula. The interviewee emphasizes that looking at the criteria for new courses is too small a scope. Not so much the development process has changed, but some courses were developed in a new way (new curricula).

New curricula have originated in response to societal pressures. Problems like climate change and resource scarcity have for example played a role when the advanced technology curriculum was designed. The advanced technology curriculum sets itself apart from more tradition curricula by offering social courses side by side with technical courses (Interview 1, 2010). This is in accordance with the idea expressed in an interview within university management that there is a need for a multidisciplinary approach (Interview 5, 2010). This is put as follows on the university's website:

“This multi disciplinary approach is needed because societal problems are never singular, and as a consequence, neither are their solutions. Moreover, by collaborating with other disciplines, one is able to get most out of one's own profession (University of Twente, n.d.(b), author's own translation).”

This way the University of Twente aims at offering education that prepares students to contribute to solutions to major problems in society. This is in line with the university's new strategic vision in which it is stated that “Smart solutions are integral solutions that combine knowledge from different disciplines (University of Twente, 2009)” The advanced technology curriculum is a good example of this vision put into practice. This curriculum also contains a course about energy, which fits with the societal pressure to use energy more efficiently (Interview 7, 2010).

Van Reekum (Member of NIKOS) (Interview, 2010) has pointed out that ‘industrieel ontwerpen’ is another example of a hybrid curriculum in which social courses are combined with technical courses. It is also this curriculum in which a new professor on the topic of ‘cradle to cradle design’ has been assigned (Werkgroep UTduurzaam, Interview, 2010). ‘Cradle to cradle design’ stands for the process of reusing materials from one product in a new product. This is pertinent given the relevance of sustainability for challenges like climate change and resource scarcity.

There are other curricula that have originated in response to societal pressures as well. A few years ago a new master called ‘sustainable energy technology’ was created in reaction to new societal pressures. Also the ‘technische geneeskunde’ bachelor originated in reaction to societal pressures, namely the increasing amount of technology put into healthcare. The ‘biomedische technologie’ bachelor has come into existence in response to similar pressures in society (Interview 7, 2010).

The university also offers students the possibility to attend a so-called minor. Although it is possible to attend a minor that is closely related to one's major, it is also possible to attend a minor from another discipline (University of Twente, n.d.(h)). An example of these minors is the minor ‘Sustainable development in developing countries’. One of the aims of this minor is to “help students from all backgrounds to develop a critical understanding of 'sustainable development' (University of Twente, n.d.(i))”. Although the groups offering this minor has been around for a few decades, and this group has always been involved in sustainability, the fact that the university lets this groups expand its activities into

a minor seems to suggest that the ‘grand social challenges’ have played a when establishing this minor. This can be true, eventhough the importance of the subject of sustainability might have stayed the same within the group offering the minor.

Some existing courses have also changed in response to the ‘grand social challenges’. This is mainly the case in technical curricula. Some professors have started using examples of problems like climate change within their courses (Interview 7, 2010; Interview 4. 2010).

We also see that more and more bachelor assignments have got something to do with for example energy and health (examples of ‘grand social challenges’). Students seem to be more interested in these subjects, and the scientific staff is offering interesting projects that are somehow related to these topics (which also suggests the scientific staff is interested in these topics) (Interview 7, 2010).

There also seems to be an increasing awareness that societal pressures will influence more courses. Van Reekum (Interview, 2010) does not see an increased importance of social courses in the more traditional technical curricula, but he thinks they will become more important in the future. Hybrid curricula like ‘advanced technology’ en ‘industrieel ontwerpen’ also tend to become more popular among students. This suggests a move towards these hybrid curricula could very well be a new trend.

The following excerpt from the strategic vision shows that the university is aware of societal pressures, and wants to address for example sustainability by acting in a more multidisciplinary way (University of Twente, 2009):

“Researchers know where to find one another on our campus. However, we have high expectations to stimulate contact between researchers in specific fields and professionals around specific application fields, researchers from sciences and social sciences, and also the UT and ITC. We have had good experiences with the university-wide field of health. An in-depth analysis of our internal strengths and weaknesses and the external opportunities has convinced us that we must also do this in the field of sustainable energy, water, risk and safety and education.”

Van Reekum (Interview, 2010) mentioned that he also sees opportunities to make curricula more multidisciplinary by combining similar courses that are now taught separately in different curricula. ‘Technisch bedrijfskunde’ and ‘Advanced technology’ are currently both offering a course centred on a business game. These courses could be combined. This way, students from different disciplines could work together on a problem, which makes them more appreciative of the contribution students from different domains can make to solve a certain problem.

The involvement of Werkgroep UTduurzaam is also an indicator that the university is aware of and responding to the challenges. During one of the interviews, Werkgroep UTduurzaam (Interview, 2010) pointed out they have been discussing a similar plan with the rector during the ‘duurzame denkavond’

they hosted on 9 December 2009. During this event, students, staff members, and the rector were given the opportunity to discuss the sustainability of the University of Twente with members of Werkgroep UTduurzaam. According to Werkgroep UTduurzaam, sustainability (which is closely related to resource scarcity and global warming) is a good example of a social problem that has to be solved in a multidisciplinary way. Sustainability is in one way or another relevant for every single curriculum at the University of Twente. The rector agrees that this is an opportunity the university should react to and is intending to explore how sustainability can be incorporated in each curriculum (Werkgroep UTduurzaam site, 2010).

Based on the results of the 'duurzame denkavond', Werkgroep UTduurzaam makes suggestions about how sustainability could be incorporated into the educational process. These have been discussed during the interview (Werkgroep UTduurzaam, Interview, 2010), and are also listed on their website (Werkgroep UTduurzaam, 2010):

1. Incorporate the basic principles of sustainability into every curriculum in a similar way. This should not be to elaborate in order to keep students interested.
2. Elaborate the role for and opportunities within the students' discipline with regard to the sustainability problems. The relevance of one's own discipline with regard to sustainability becomes clear.
3. Solve realistic social sustainability cases together with students from different disciplines. These cases can only be solved with expertise from the different disciplines. Students realize they are needed when solving social problems like these.

This way, Werkgroep UTduurzaam (Interview, 2010) wants to make clear that sustainability also has behavioural components. A question that could for example be answered by students from behavioural sciences is: "How do we motivate a group of people to act in a more sustainable way?" Non-technical curricula currently do not have much to do with sustainability, and this should change according to Werkgroep UTduurzaam. Within technical curricula there is still room for improvement as well (Werkgroep UTduurzaam, Interview, 2010).

The fact that the rector is willing to engage in discussion with parties like Werkgroep UTduurzaam signals the university's growing commitment to and awareness of challenges like sustainability.

4.1.2. Evidence suggesting superficial or no change

Changes in traditional technical curricula regarding the 'grand social challenges' are mainly limited to an increase in the number of examples used related to these challenges within the existing courses (Interview 4, 2010; Interview 7, 2010), the rest of the curricula have remained more or less the same. The scope of fundamental changes in these curricula is thus fairly limited. Curricula like 'bedrijfskunde' en 'bestuurskunde' have not changed significantly in response to the 'grand social challenges' either (Van Reekum, Interview, 2010; Werkgroep

UTduurzaam, Interview, 2010). Van Reekum (Interview, 2010) has mentioned that there have been plans to incorporate sustainability into the 'project BK3' course. But this has not lead to anything concrete yet.

Also, in several interviews it is mentioned that universities are receiving less money for education, and it is getting more difficult to keep curricula financially viable. This brings with it the danger of bureaucratization, which might stop professors from implementing their contribution to tackling the 'grand social challenges' (Interview 1, 2010; Interview 4, 2010).

4.1.3. Total evidence

From the previous two sections we conclude that there has been some fundamental change in some areas of the course development process. The evidence suggesting fundamental change seems to be prevailing. Because there are still some big areas that are mainly unaffected, the total score we give at this point will be 6,5.

4.2. Promotion

It has become clear that the university has changed its promotional activities in response to the 'grand social challenges'. Often these changes are accompanied by concrete plans to actually make a difference, or describe real changes. This would suggest fundamental change in this area. It is also the case that the contribution the university is making to the 'grand social challenges' in some areas could, and perhaps should, be made clearer in the university's promotion. The promotion does not seem to be exaggerating the university's contribution at most points.

However, it could be made clearer that the multidisciplinary nature of its curricula the University of Twente emphasizes in its promotions does not apply to all curricula to the same extent. It is also true that a lot of promotional claims made with regard to the grand social challenges are made with regard to the future, which makes it impossible to assess to what extent these claims will represent actual changes.

4.2.1. Evidence suggesting fundamental change

The University of Twente is currently working on the 'groene campus' project. The university wants to create a sustainable campus by applying new technology. An example of this is trying to close the water circuit on the campus (Mulder, Interview, 2010; University of Twente, 2010). One of the advantages of this project is the PR value it creates. This project also brings people at the University of Twente closer together (for example, researcher are working together with people from the facilities company) (Mulder, Interview 2010).

The site 'startnotitie groene campus' says the following about the 'groene campus' (University of Twente, n.d.(d)):

“The University of Twente presents itself as a sustainable university with a green campus, where sustainable development and innovation is embedded into the university’s education, research, and operational management. Because of university’s social involvement and responsibility the university wants sustainably to start playing a bigger role in the years to come.

The university wants to set an example and gain insight into its own footprint in order to deal with this consciously. The university wants to stimulate everyone within the University of Twente to contribute to make living and working at the campus more sustainable. The users are central in this project.

The university also wants to use the campus as a living lab for sustainable ideas and activities. This way the campus becomes a realistic and attractive setting for testing, developing and presenting new products and services.”

From this it becomes clear that an important aspect of this project is the promotion it entails. This is thus a good example of the university’s promotion changing in response to the ‘grand social challenges’. What’s important is that this document does not entail sheer promotion, but also makes concrete plans for the future.

Werkgroep UTduurzaam has suggested making the annual running event, called the ‘Batavierenrace’, more sustainable. Werkgroep UTduurzaam is collaborating with ‘Morgen’ (a national network of students working for a sustainable lifestyle and operational management within universities and schools for Higher Vocational Education) on this project. The university has reacted positively to this suggestion, and there is a good chance the university will turn the ‘duurzame Batavierenrace’ into reality. Werkgroep UTduurzaam thinks this is a good way of showing to the world the university is taking sustainability seriously (and thus reacting to this challenge). Sustainability should be seen as an opportunity instead of a threat, it offers a new way of stressing the university’s distinctive features (Werkgroep UTduurzaam, Interview, 2010). One of the effects of the ‘Batavierenrace’, is that the University of Twente receives attention from both local and national media. If the university decides to make this event more sustainable, this would be a change in promotion in response to certain societal challenges. And here the change in promotion would also bring with it real change in the university’s operations, just as is the case with the ‘groene campus project’.

The current mission statement of the University of Twente is: “developing solutions for the challenges of the future” (Mulder, Interview, 2010). This is very much in line with the idea that universities are responding to the ‘grand social challenges’. The University of Twente wants to bring these solutions into society in an entrepreneurial way, which is a fairly unique position in ‘grand challenge-thinking’. This way the solutions are most likely to make a difference (Mulder,

Interview, 2010). Here the aim is again to make real changes inside and outside of the university.

In the new strategic vision of the University of Twente this is phrased as follows (University of Twente, 2009):

“As a modern, entrepreneurial university, we are renowned for the help we provide to industry and commerce through our engineering approach and the creation of new innovative businesses. And we provide unexpected solutions in areas such as energy, sustainability, health and safety.”

As already shown under the heading ‘course development’, there have been some changes within the university in response to the ‘grand social challenges’; these changes could play a bigger role in the university’s communication than is currently the case. Currently, a lot of people are unaware of what the university is actually doing in response to the ‘grand social challenges’ (Interview 7, 2010; Interview 5, 2010). This would suggest that the university itself has changed even more in some areas than the promotional activity.

4.2.2. Evidence suggesting superficial or no change

The university wants to create solutions by combining technology with behavioural, social and management sciences. They call it high tech, human touch (Interview 5, 2010; Interview 8, 2010). This is phrased as follows in the university’s new strategic vision (University of Twente, 2009):

“We do not approach new technologies in isolation, but create relationships between behavioral, social, and management sciences. Combining high tech with a human touch, we strive to introduce scientific innovations, to educate people that can make a difference, and to offer solutions to problems present in the world around us.

This is another example of the university changing its promotion in response to the ‘grand social challenges’. However, in the section about course development it has become clear that the multidisciplinary nature of the curricula at the university is mainly descriptive of the hybrid curricula. In the promotion, this distinction is less clear. See for example the ‘bachelor opleidingen site (University of Twente, n.d.(b))’. Here it is suggested that all curricula at the University of Twente are multidisciplinary in nature, which is not entirely the case.

At some points it is also difficult to tell whether or not the changes in promotion represent actual changes. Mulder (Interview, 2010) stresses that the strategic vision is a vision for the future, and not a representation of the current situation at the university. It is the goal to have accomplished these things by the year 2014. It is thus difficult to say to what extent the university is living up to its plans.

4.2.3. Total evidence

The conclusion we draw is that the changes in promotion at the University of Twente are largely in accordance with actual changes or concrete plans. At some areas the promotion could even be extended without exaggerating. However, a more nuanced description might be needed in other areas. Based on this we have assigned a score of 8,5.

4.3. Attracting funds

It has become clear that the funding practice with regard to education does not seem to have changed much in reaction to the ‘grand social challenges’. There does not seem to be a relation between the amount of money a university receives for education and their reaction to the ‘grand social challenges’. Changes in funding only seem to take place at the research side of the university. Changes in the curricula in response to interests from resource providers can thus mainly be attributed to the changes brought about at the research side. It is however impossible to determine whether or not these changes in education are a deliberate consequence of the changes in research mandated by the funders of this research. (Please note the in this section the evidence suggesting superficial or no change is given first in order to be able to tell a consistent story)

4.3.1. Evidence suggesting superficial or no change

There does not seem to be a direct relation between the funding of education and the university’s reaction to the ‘grand social challenges’. The government does not make it mandatory upon the university to include certain topics in curricula (Interview 7, 2010). At the same time the amount of government money available for education is getting smaller and smaller, and it is difficult to replenish the diminishing flow of money from the government by turning to companies. Universities do not seem to be able to significantly increase the amount of money available for education by changing their behaviour. As a result, it is getting more and more difficult to keep curricula profitable (Interview 1, 2010).

The government is currently redistributing money among universities. The best researchers will for example receive more money than was previously the case. People within the university that do not do research tend to lose money. The people that are getting more money want to use it for the research based on which the money was awarded instead of giving it to people that have been getting less money. This way the awarded money usually is not spent on education (Interview 1, 2010).

Changes in funding predominantly take place at the research side of the university. The kind of research undertaken is getting more and more dependent on ‘NWO’ programs (Van Reekum, Interview, 2010). The allocation of money is (among other things) dependent on roadmaps. However, the importance of the ‘grand social challenges’ does not seem very high in these roadmaps (Interview 1,

2010; Commissie Nationale Roadmap Grootchalige Onderzoeks faciliteiten, 2008, pp. 17-19).

These roadmaps are made by the NWO. This organization describes its purpose as follows: “The Netherlands Organisation for Scientific Research (NWO) funds thousands of top researchers at universities and institutes and steers the course of Dutch science by means of subsidies and research programs (NWO, n.d.(a))”. Beside these roadmaps, this organization does much more that is related to funding. NWO describes (part of) its activities as follows:

“The thematic programmes combine NWO's ambitions for Consolidating strengths and Science for society. The themes are intended to create focus and mass. They cover multidisciplinary research programmes in subjects that are scientifically and/or socially current issues.

NWO has chosen 13 subjects to bear the thematic programme in the strategy period 2007-2010. These subjects are shown in table 4.1 (NWO, n.d.(b))”:

Table 4.1. Thematic program NWO

1. Basic Energy Research formerly: New Methods for Production, Storage, Transport and Use of Energy
2. Brain and Cognition
3. Conflict and Security
4. Cultural Dynamics
5. Dynamics of Complex Systems
6. Dynamics of Life Courses
7. Knowledge Base for ICT Applications
8. New Instruments for Health Care
9. Research & Innovation in Smart Creative Contexts - RISCC (Formerly: Creative Industry)
10. Responsible Innovation
11. Sustainable Earth
12. Systems Biology
13. Use of Nanosciences and Nanotechnology

(Source: NWO, n.d.(b))

From this it becomes clear that the ‘grand social challenges’ do indeed play a role within some of their themes (despite the limited attention to the ‘grand social challenges’ in roadmaps). So at least part of universities’ research funding is dependent on their reaction to the ‘grand social challenges’. Also Mulder (Interview, 2010) sees there is an increasing amount of research grants available for topics related to the ‘grand social challenges’. Funding also takes place at an international level. Nowadays it is also possible to attract funding from Brussels (Interview 5, 2010). ‘Grand social challenges’ play a role in this funding (Interview 7, 2010) as well.

The university is also doing a lot of research for companies (Van Reekum, Interview, 2010). Companies react to the same societal pressures as universities. Universities and companies are becoming partners when reacting to these

pressures (Interview 7, 2010). Consequently, ‘grand social challenges’ also play a role when doing research with/for companies.

4.3.2. Evidence suggesting fundamental change

According to Van Reekum (Interview, 2010), health (one of the ‘grand social challenges’) has become very important in both the research and education at the University of Twente. As will be shown later, the contents of education are closely related to some of the research that is taking place at the university. Its resource providers, in this way, influence the activities a university undertakes at the educational side. Health (New Instruments for Health Care) is for example one of the themes of NWO, and the research the university undertakes in reaction to funding based on this theme influences the university’s education.

The University is also receiving so-called “SPRINT (Stimuleringsprogramma Innovatief Natuurwetenschappelijk en Technisch onderwijs) gelden”. Entrepreneurship and sustainability in education play a role in this funding. The effect of this funding on education is however rather limited (Interview 1, 2010).

4.3.3. Total evidence

The conclusion we draw is that the process of attracting funds for education has not changed significantly. The university’s reaction to the ‘grand social challenges’ does not seem to affect funding in a meaningful way. The university is however reacting to pressures from resource providers in research. This also influences education. Based on this, we have awarded a score of 3.

4.4. Recruitment

It has become clear that the university has only made a few changes in the recruitment process in reaction to the ‘grand social challenges’. Arranging the curricula by theme during for example the information days has allowed for an increased emphasis on themes like health and energy. There are however a lot of pressures influencing this process, which makes the ‘grand social challenges’ only play a role in a few of the changes. The ‘grand social challenges’ also seem to be more important to companies and the government than to students.

4.4.1. Evidence suggesting fundamental change

Information days are currently much more centred on themes than was previously the case. Energy and health are examples of these themes. Curricula that are relevant for these themes are clustered on the ‘orientation market’. This new structure of arranging curricula by theme has been set up to give prospective students a better idea of what is possible at the University of Twente. They do not have to choose 2 curricula in advance they want to know more about, but can browse through everything the university has to offer (Interview 8, 2010; Interview 5, 2010). This way, the university can present itself based on the

different themes they are contributing to. An additional advantage of this new structure is that it became possible to emphasize what the university is doing in response to problems related to for example health care and energy (in retrospect, these problems can be filed under ‘grand social challenges’) (Interview 8, 2010).

Every year a so called ‘campagne krant (brochure in the form of a newspaper)’ has been handed out to potential students. The different themes around which the curricula are centred are discussed in this ‘campagne krant’. One time, the university has used climate change as an example to show what the curricula surrounding a certain theme could contribute to solving this problem. Some examples have also involved the application of technology in society (Interview 8, 2010).

4.4.2. Evidence suggesting superficial or no change

There are however a lot of changes going on within the recruitment process that are not directly related to the ‘grand social challenges’. The internet is getting more important when trying to reach prospective students, and the university has to figure out how to best put this relatively new medium to use. Prospective students want to be able to find the information they need whenever they want, and universities will have to respond to this. The university has also been busy increasing its brand awareness. Too little prospective students know the University of Twente exists and what it has to offer. This has to change (Interview 8, 2010). From this it become clear that this process is receiving pressure from different angles, and only so much attention can be given to a certain pressure. The reaction to the ‘grand social challenges’ in the recruitment process is only visible in a few aspects of this process, which might be due to all the different kinds of pressure exerted on this process.

Mulder (Interview, 2010) also thinks the ‘grand social challenges’ are currently playing a limited role within this process. At the moment the ‘grand social challenges’ are more important in communication towards companies and the government than to students. Prospective students tend to be more interested in other aspects of the curriculum than its relevance for ‘grand social challenges’ (Mulder, Interview, 2010; Interview 1, 2010).

4.4.3. Total evidence

We conclude that only a limited number of aspects of the recruitment process have changed. Because of this, the score we awarded is 5,5.

4.5. Course delivery

It has become clear that the course delivery has changed at some point even more than the actual course description. This is the case when professors have started using examples related to the ‘grand social challenge’ without a change in the course itself. The teaching staff also seems to have translated changes in curricula

to changes in course delivery. However, in some curricula that have not changed, the course delivery has also remained the same.

4.5.1. Evidence suggesting fundamental change

We have already discussed most of the changes to course delivery under the heading ‘course development’. Here, it has become clear that the delivery of the course has changed in some technical curricula, without a change to the course itself. The main change is that examples related to the ‘grand social challenges’ have become more important. In the 70’s an example professors would give could be ‘how to make plastic’, now a popular example would be ‘how to make plastic using old plastic bags’ (Interview 4, 2010). Another example of change is the increased importance of the application in society of the technology that is taught (Interview 4, 2010).

In case a new curriculum has come into existence, the main change was the combination of social and technical courses. The fact that professors are actually teaching courses in this way indicates that the course delivery is in line with the developed curricula.

4.5.2. Evidence suggesting superficial or no change

However, under the heading ‘course development’, it has also become clear that some curricula have not changed at all. Also the course delivery has remained the same in courses related to these curricula. So not all curricula have undergone change in course delivery.

4.5.3. Total evidence

We conclude that the changes in course delivery are in line with changes in course development, and at some points, these changes are even more drastic than the changes in course development. The score that we have awarded based on this is 9.

4.6. Alumni relations

It has become clear that the university is starting to lay the framework for using alumni when reacting to the ‘grand social challenges’. Alumni are getting more important for staying in contact with society. The fact that the alumni magazine can be used to show what the university is doing and some alumni are contacted relatively frequently makes it possible to use alumni for this purpose. This way, it becomes possible to better react to the ‘grand social challenges’, and show alumni what is done about these challenges.

However, because the alumni magazine only changes this academic year, and it is impossible to determine what changes are reactions to alumni involvement, it is difficult to determine to what extent these possibilities are actually used.

4.6.1. Evidence suggesting fundamental change

It is getting increasingly important for universities to be able to reach their alumni. These alumni could for example play a role when students are looking for internships. It is also important alumni know what is going on, because their friends and family turn to them when they want to know more about what is possible at the university. Their grandchildren might be asking them about the university and this information plays a role when they are choosing a university of their own. These are reasons why the university wants to keep alumni involved to some extent (Interview 5, 2010). The new strategic vision also shows that alumni are getting more and more important, and that the university is planning on intensifying the involvement of alumni within the university:

“Our students and alumni have a crucial role: they are our ambassadors. Their attitudes, knowledge and skills demonstrate what can be learned at Twente. Alumni open doors to other organizations, provide support for new initiatives, and feedback essential information about the world outside Twente. We want to improve how our alumni are involved in our development, and by offering a variety of innovative alumni services, we also strive to continue to support their development (University of Twente, 2009).”

From this it becomes clear that the university (among other things) wants to better serve the world outside by improving its involvement with alumni. This increased focus on the world outside the university allows for a more elaborate reaction to the ‘grand social challenges’.

Contact with alumni is sustained by offering them the ability to participate in activities, or attend special lectures (Interview 5, 2010). Another important means of staying in touch with alumni is publication of an ‘alumni magazine’. Previously this magazine was mainly about what different alumni were currently doing, but as of this academic year, this magazine will focus on what is going on at the university. The university can for example use this magazine to show what it is doing to fight climate change. This is an example of the university’s reaction to (among other things) ‘grand social challenges’ (possibly) getting more important when dealing with alumni (Interview 5, 2010).

There also is a so-called ‘topgroep’ of alumni that occupy important positions in society and business. The university invites this group quite often in order to give advice. They also function as ambassadors of the university. There is also a ‘tussenkring’ from very active alumni. This group is also contacted more often than regular alumni (Mulder, Interview 2010). This way, the university wants to stay in close contact with society.

4.6.2. Evidence suggesting superficial or no change

Besides the fact that alumni are getting more important for universities, in Europe is not common for alumni to help fund universities. No university on the European continent has been able to successfully attract substantial amounts of money from its alumni (Mulder, Interview, 2010). This might check the involvement of alumni.

It is also true that the increased importance of alumni does not necessarily mean the university will actually act upon this. Currently, there are some plans to increase their involvement, but the number of concrete actions is limited.

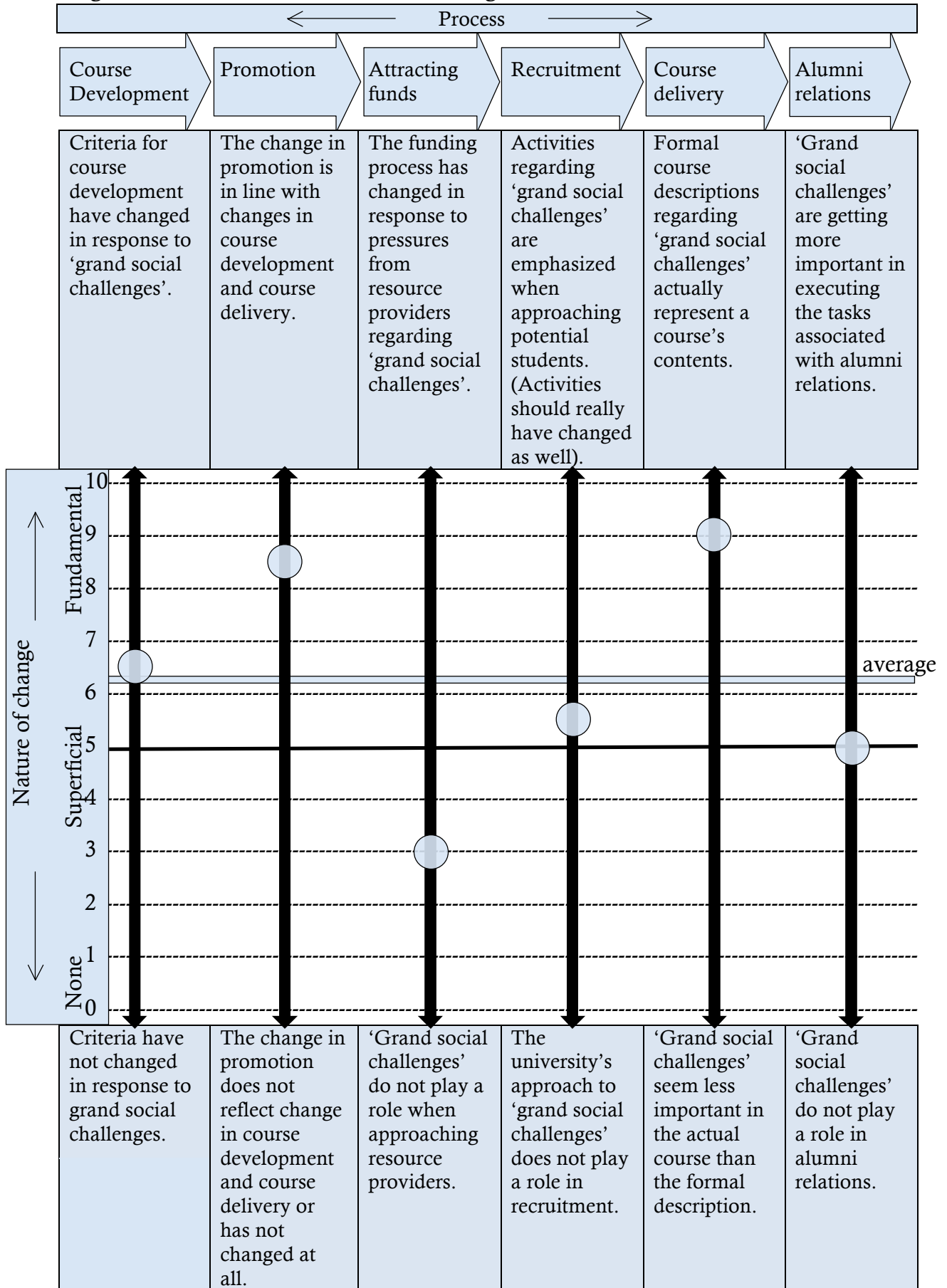
4.6.3. Total evidence

We conclude that alumni are getting more and more important for the university in general. The university is also starting to lay the foundations for using alumni when reacting to the 'grand social challenges'. It is still uncertain, however, to what extent this will translate into concrete actions. Because of this, we have awarded a score of 5.

4.7. Framework

The scores determined in section 4.1 to 4.6 are shown in figure 4.1.

Figure 4.1. Criteria for the nature of change



5. Stakeholders

During the interviews it became clear that it was difficult to determine which stakeholders influenced which processes. Most stakeholder influence turned out to be indirect, which made it problematic to determine what the exact effects were of a certain stakeholder's involvement. That is why we will discuss each relevant stakeholder and its involvement separately, without making the distinction between the different processes.

5.1. The government

The University of Twente seems to be reacting to wishes from the government. This also affects its education. The ways in which this happens are shown in the bullet point list below.

In several interviews it was mentioned that there is a close relation between research, and the topics of education. The University of Twente for example noticed that there was a lot of research going on in the field of health related technology. This has played a major role in the development of curricula like 'biomedische technologie' and 'technische geneeskunde'. Topics discussed in the courses in these curricula tend to relate to the research the university conducts (Van Reekum, Interview, 2010). Because the government is one of the stakeholders influencing the research at the University of Twente (more stakeholders will be discussed later), they indirectly influence the contents of education. That is why some examples of research relevant for education are also included in the bullet point list.

- It has become clear that the government stimulates research related to the 'grand social challenges'. In the Netherlands, NWO regulates most government research funding. Their agenda is starting to become more 'grand challenge' based. Grants are getting available for research related to the 'grand social challenges'. These grants are labelled less rigidly than was previously the case. Not all specifics of the research are defined beforehand. When a university is working on sustainable energy, a grant is usually available. This freedom leaves room for innovation in this area (Mulder, Interview, 2010). Some funding that was previously unlabelled, is currently getting labelled. The 'grand social challenges' do play a role when this labelling occurs (Van Reekum, Interview, 2010). This way, the government stimulates research related to the 'grand social challenges'. Another interviewee also noticed this increased attention to 'grand social challenges' in government funding, and mentioned that there are a lot of funds available for research related to these challenges. Professors tend to react to the funds available, so if sustainability is a big issue, and the funds are there, the research projects will be about sustainability (Interview 4, 2010). This way, the university reacts to wishes from the government (Interview 4, 2010; Interview 7, 2010). Research in fields like sustainability and health care is likely to become more important to governments, also at a European level (University of

Twente, 2009). Because funding from Brussels is getting more important for the University of Twente (Interview 5, 2010), the 'grand social challenges' are likely to play a role in this area as well.

There are a couple examples of research undertaken within the University of Twente that is related to the 'grand social challenges'. The government plays an important role in some of this research. Examples of government influence on 'grand social challenge' related research at the university are shown in appendix 2. At the University of Twente, there are several groups that focus on problems related to the 'grand social challenges' (Werkgroep UTduurzaam, Interview, 2010). As will be shown later, there are more stakeholders that influence research at the University of Twente. So the development of these groups and changes in research cannot be attributed to government influence alone. However, these groups are already mentioned at this stage to give an idea of what changes in research are occurring at the University of Twente in response to the 'grand social challenges'. Examples of these groups are CSTM and IMPACT (Werkgroep UTduurzaam, Interview, 2010; CSTM, n.d.; IMPACT, n.d.), and a description of the activities these groups undertake is given in appendix 3.

- The government also stimulates entrepreneurship in for example health care. The government thinks this is needed in order to keep healthcare manageable (Van Reekum, Interview, 2010), and thus to be able to react to 'grand social challenges' related to health care. Universities respond by offering courses in entrepreneurship (Van Reekum, Interview, 2010). This is another way in which the government indirectly influences education.
- The government's direct influence on the contents of education at universities is rather limited (Interview 4, 2010). The government for example does not send letters about what the education should be about. There were however a few examples of direct government influence discussed during the interviews. One of these examples is the SPRINT programme. The government pays so-called 'SPRINT gelden' to the University of Twente. This funding plays a role in the increased focus of the university on entrepreneurship (Interview 1, 2010; University of Twente, n.d.(g)). Sustainability is also starting to play a role in the SPRINT programme (Sprint, n.d.). The actual effect of this programme in relation to the 'grand social challenges' is however rather limited (Interview 1, 2010).
- Another example of direct government influence on the education at the universities is a report by the 'commissie Veerman'. This report urges universities to differentiate (Mulder, Interview, 2010). 'Grand social challenges' might start playing a role when universities are trying to differentiate. It is however too soon to say to what extent this is panning out.

Based on these points we can conclude that the government has both the power and legitimacy to influence the education at the University of Twente. After all, the government finances the education of universities. The government's claims

regarding to the ‘grand social challenges’ also seem to be getting more and more urgent. Although these pressures usually are not directly aimed at the education of the University of Twente, they do influence the education. The government is thus a definitive stakeholder (table 5.1):

Table 5.1. The government as a stakeholder

Government		
Attribute ↓	Presence of attribute→	
		Present
		Not present
Stakeholder power		X
Stakeholder legitimacy		X
Stakeholder urgency		X

5.2. Businesses

It has become clear that there is contact with companies about the curricula the university offers. The ‘grand social challenges’ play a role in some of these contacts. It should however be noted that companies usually do not come to the university, but the university tries to assess what companies want in order to react to the environment. Internships and detachment of employees are other ways in which companies can influence education. Businesses also influence research at the University of Twente. Via this way they indirectly influence ‘grand challenge’ related education at the university. We discuss the influences outlined here in the bullet point list below.

- Businesses do not really exert pressure on the University of Twente to change its teaching activities in response to the ‘grand social challenges’ (Mulder, Interview, 2010; Interview 4, 2010; Interview 7, 2010). They do however influence curricula. When companies are initiating collaboration with the university in the field of education, this is mainly done to ensure adequately educated students for the work that is needed within the company. The master track ‘process technology’ of ‘chemical engineering’ is for example being sustained because of contact with businesses. The role the ‘grand social challenges’ play in this is however limited. (Interview 7, 2010).
- Businesses are currently in need of broadly educated engineers. The advanced technology curriculum has been created in close contact with business in order to create a curriculum that is very relevant for society. The curriculum had to (among other things) contribute to educating students that are able to solve social problems. Climate change and resource scarcity are examples of these problems. These are problems that have to be tackled in a multidisciplinary way. This way the industry played a role in the creation of the advanced technology curriculum. It is however true that the university reacted to a change in its environment instead of direct pressure from companies. In this case, companies did not come to the university, but the university tried to assess what companies

wanted (Interview 1, 2010). The university generally initiates collaboration that is aimed at bringing about changes related to 'grand social challenges' (Interview 7, 2010).

- Businesses are also involved in for example internships. Good connections with companies are important. A lot of projects are for example done in concert with DSM and Shell (Interview 4, 2010). This way, companies can directly influence education.
- Another way in which companies tend to play a role in changes within curricula is detaching an employee that can work as a professor within the university. This option is, however, primarily concerned with the availability of adequately educated students instead of 'grand social challenges' (Interview 1, 2010).
- Some research the university does for/with companies has something to do with the 'grand social challenges' (Mulder, Interview, 2010). Energy and health are examples of subjects of these research projects. Research groups also need businesses in order to survive. Because the amount of money universities receive from the government is decreasing, they need to enter into commercial contracts. Approximately fifteen per cent of the financing of research comes from businesses (Interview 7, 2010). Examples of business involvement in research the university is undertaking with regard to the 'grand social challenges' are shown in appendix 4. Under the heading 'government', it has already been shown that the contents of education are related to the research the university is undertaking. Because businesses influence the research, they indirectly influence the education. Given that businesses are working with the university on research that has something to do with the 'grand social challenges', they indirectly influence the role the 'grand social challenges' play in education.

Based on these points we have concluded that businesses have the legitimacy to influence education at the University of Twente. Most students will after all have to work at these businesses after they have graduated, and their education has to prepare them for that. In the new strategic vision it is also stated that the university wants to prepare students optimally for working in business or the public sector (University of Twente, 2009). Businesses' claims regarding the 'grand social challenges' are also getting more and more urgent. Currently they are mainly influencing education through research. But given the fact that companies have been consulted when creating for example the advanced technology curriculum, they are also starting to directly influence education that is related to the 'grand social challenges'. However, because businesses do not finance the education, their power is rather limited. Businesses are thus dependent stakeholders (table 5.2):

Table 5.2. Businesses as stakeholders

Businesses		
Attribute	Presence of attribute→	
↓		
Stakeholder power		X
Stakeholder legitimacy	X	
Stakeholder urgency	X	

5.3. Society

The third stakeholder considered here is society. It is true that this is not a real stakeholder in terms of a distinguishable entity. But because social awareness or societal pressure is a frequently used reason for reacting to the ‘grand social challenges’, we will treat it as a separate stakeholder.

It has become clear that social awareness from the professors has been important in changes in the examples used in the courses. This influences research as well. The university as a whole is also getting more aware of pressures from society. This has contributed to the creation of curricula like ‘technische geneeskunde’, and also research has changed because of this. However, economic viability still plays a role. The societal pressures outlined here are discussed in the bullet point list below.

- During the interviews it turned out that social awareness is another important reason for incorporating ‘grand social challenges’ into the university’s education. The usage of examples related to the challenges is dependent on the professor and his/her social awareness. This is one of the ways in which the university is reacting to what is going on in society (Interview 1, 2010; Interview 4, 2010).
- Society not only influences education, but also the research that is done by the university. This happens directly through the increased social awareness of professors, and indirectly because if society for example makes it more expensive to produce waste, companies will be more interest in working with universities to find solutions for problems with waste (Interview 4, 2010). Professors also tend to get quite some freedom regarding the contents of their research (Van Reekum, Interview, 2010). This allows them to do the research they find relevant for society. Under the heading ‘government’, it has already been shown that the contents of education are related to the research the university is undertaking. Because society influences the research, education is influenced indirectly.
- Social awareness of the university in general plays a role as well in the university’s reaction to the ‘grand social challenges’. The university feels it needs to engage in socially relevant activities in order to confirm its right to exist as an institution (Interview 1, 2010). In the new strategic vision, the university for example states that it wants to “focus on the public

visibility” of their work (University of Twente, 2009). A stronger sense of citizenship is emerging as well. (Mulder, Interview, 2010). Because of this, the ‘grand social challenges’ start playing a bigger role in education. The curriculum ‘technische geneeskunde’ has for example been created mainly in response to pressures from society (Interview 7, 2010).

Because of the university’s social commitment and responsibility, they want to give sustainability a more prominent place in both research and education (University of Twente, n.d.(d)). An example of this is the fact that the rector is willing to attend the ‘duurzame denkavond’ of Werkgroep UTduurzaam (Werkgroep UTduurzaam, Interview, 2010). Another example is the ‘Copernicus University Charter for Sustainable Development’ the university signed. This is an initiative from the CRE, the association of European universities. Based on this, the following goals have been set, which will directly or indirectly influence education (University of Twente, n.d.(d)):

- Sustainably as a subject of research (technical, ethical, social), but also as intrinsic value when executing a project.
 - Sustainability as theme in both bachelor and master curricula, and the development of a special sustainability curriculum
- Economic viability still plays a role however. The ‘grand social challenges’ can often be seen as a business opportunity. An example of this is trying to make cleaner energy an economically viable option. This could be perceived as ‘professional idealism’ (Mulder, Interview, 2010). The university chooses to play a social role, and sometimes uses businesses to be able to do this. But the main reason the university is starting to react to the ‘grand social challenges’ seems to be the university’s social motivation (Interview 7, 2010). In the new strategic vision this is put as follows:

“Our entrepreneurial attitude is also apparent in the collaboration with commercial and public organizations both inside and outside the region. This will remain our focus; we are even adding new activities because we believe this is the best way to make knowledge applicable and to remain responsive to the demands of society (University of Twente, 2009).”

It can be concluded that society has both the power and the legitimacy to influence the university’s behaviour. The university is feeling pressure to meet societal expectations related to for example climate change and the validity of science. So indirectly, society has power and legitimacy because although society does not fund research directly, elected representatives are starting to get pressure to ask what we are getting for our money. Society’s claims regarding the ‘grand social challenges’ are also quite strong (urgency). They are perhaps even stronger than those of the government and businesses, because some of the pressure those parties exercise is actually social pressure being exerted indirectly. Social demands seem to be the biggest motivator for the university to react to the ‘grand social challenges’ (Interview 7, 2010). Society is thus a definitive stakeholder (table 5.3):

Table 5.3. Society as a stakeholder

Society		
Attribute ↓	Presence of attribute→	
		Present
		Not present
Stakeholder power		X
Stakeholder legitimacy		X
Stakeholder urgency		X

5.4. Students

It has become clear that students are very important for the university. Communication towards students is not really centred on ‘grand social challenges’, but students are starting to influence education to become more grand challenge based. They seem to prefer the hybrid curricula the university is offering over the more traditional curricula, and they are choosing bachelor assignments that have got something to do with these challenges. These pressures from students will be discussed in this section (5.4).

Students are essential for universities. Without students, a university cannot offer education. The university puts a lot of effort into convincing potential students to come to the University of Twente (Interview 8, 2010; Interview 5, 2010; Interview 1, 2010). It is true that some curricula the University of Twente is teaching are available at other universities as well. Universities do this to keep potential students in their regions from choosing for other universities (Van Reekum, Interview, 2010). The university, however, does not (yet) emphasize the ‘grand social challenges’ in communications toward students (Interview 8, 2010). Mulder (Interview, 2010) sees that the ‘grand social challenges’ play a bigger role in communications towards businesses and the government than to students.

Students influence the education offered at the University of Twente. They tend to choose the more hybrid curricula like ‘advanced technology’ over more traditional engineering curricula (Van Reekum, Interview, 2010; Interview 7, 2010). This way they contribute to the increased offering of curricula that allow them to better help solve the ‘grand social challenges’. By choosing bachelor assignments that have got something to do with one of the ‘grand social challenges’, they also influence the education (Interview 7, 2010). Another way in which students can influence education is by filling out evaluation forms. Based on this, courses can change (Interview 4, 2010).

It can be concluded that students are very important for the university, which gives them the legitimacy to influence the education. The claims they ‘make’ regarding the ‘grand social challenges’ are mainly expressed through actions, and the university seems to be responding to these pressures. The university seems to consider these claims urgent, and is putting effort into meeting student’s needs. This suggests students possess the attribute ‘urgency’ as well. The power of individual students seems rather limited however. Students are thus dependent stakeholders (table 5.4):

Table 5.4. Students as stakeholders

Students		
Attribute ↓	Presence of attribute→	
	Present	Not present
Stakeholder power		X
Stakeholder legitimacy	X	
Stakeholder urgency	X	

5.5. Alumni

It has become clear that alumni are gaining some importance because of their involvement in acquiring internships and the feedback they give on the fit between their current occupation and the things they learned at the University of Twente. Influence in other areas seems limited however. The role they play in for example funding is quite limited compared to other parts of the world. These alumni pressures are discussed in this section (5.5).

Sometimes, alumni contact the university in order to give their opinion about what is happening at the university (Interview 5, 2010). However, these contacts don't occur on a regular basis. And also contact initiated by the university is still relatively ad hoc. The university for example contacts alumni for internships, but this only happens incidentally (Interview 7, 2010). Another reason to contact alumni is to assess to what extent the curriculum they followed fits with their current occupation (Interview 4, 2010). 'Grand social challenges' might play a role in this. Because of things like these, alumni are getting more important for the university.

Despite the fact that Alumni in for example the United States are gaining importance in funding universities, in Europe it does not seem to work that way. Alumni might start playing a role in funding in the future, but this is not yet the case (Mulder, Interview, 2010).

Alumni seem to be legitimate stakeholders. After all, the university contacts them now and again to consult them. By doing this, the university seems to acknowledge their legitimacy. Their power seems quite limited however; their involvement is rather narrow in scope. They do not seem to be making urgent claims regarding the 'grand social challenges' either. Alumni are thus discretionary stakeholders (table 5.5):

Table 5.5. Alumni as stakeholders

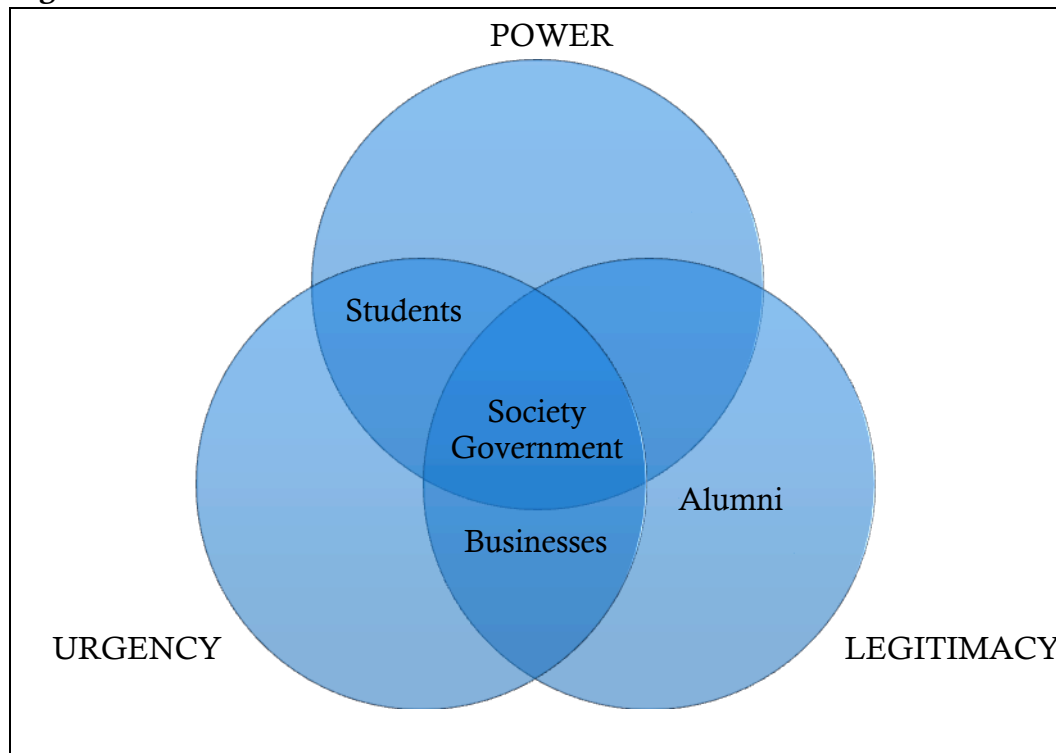
Alumni		
Attribute	Presence of attribute→	
		Present Not present
↓		
Stakeholder power		X
Stakeholder legitimacy	X	
Stakeholder urgency		X

5.6. Overview

In this section we give an overview of the kinds of stakeholders operating close to the University of Twente. We have rated these stakeholders based on their influence on the university with regard to the ‘grand social challenges’. The more definitive stakeholders there are, and the more attributes each of the other stakeholders possess, the more dependent the university seems to be on the societal pressures when reacting to the challenges.

It turns out that there are two stakeholders that are definitive stakeholders. Namely: Society and the government. Businesses and Students possess two of the three attributes a stakeholder can possess (expectant stakeholders). Alumni possess only one of the attributes (latent stakeholder). In figure 5.1 this is shown graphically. In conclusion it can be said that the stakeholders are quite important for the university when reacting to the grand social challenges.

Figure 5.1. Stakeholders and their attributes



6. Universities in terms of pleas

We have also asked respondents to assess what plea currently most accurately describes the University of Twente. It turned out to be quite difficult to make a judgment about this. People weren't clear about this in their own minds. Because of this, this chapter is more limited in scope compared to the previous two chapters. Evidence that we have been able to collect is shown in this chapter. Information that was given during the interview regarding the different pleas will be discussed in sections 6.1 through 6.2. The first section shows evidence suggesting a networked university and the second section shows evidence suggesting an entrepreneurial university. In section 6.3, we draw conclusions from this evidence. Both the economic plea and the interdependent plea are again outlined in table 6.1.

Table 6.1. The economic and the interdependent plea

	<i>Economic Plea</i>	<i>Interdependent Plea</i>
	Entrepreneurial university	Networked university
<i>View on knowledge</i>	Economic commodity	Resource that can be exchanged in a network of stakeholders. Not always in return for money.
<i>'Homo academicus'</i>	Entrepreneur	Actor acting on behalf of the community (university) in a network of stakeholders
<i>Social orientation</i>	Economic role	Promoter of the interests of the network as a whole.
<i>Pursuing autonomy from:.....</i>	Politics and the government	Communities outside the network
<i>Control of science</i>	Professional management and contract research	Agreement within the network

6.1. Evidence suggesting a networked university

The changes in response to the 'grand social challenges' were made based on demands from stakeholder in the 'network' of the university. Demands from the stakeholder 'society' seemed to be most powerful in this process (Interview 7, 2010). The fact that these societal pressures prompted the university to take action would suggest the university is promoting the interest of the network as a whole.

The university is also cooperating with 'Het Roessingh' (Van Reekum, Interview, 2010). This would suggest that (regional) interests of the knowledge network as a whole are promoted, meeting (inter)national social challenges of the knowledge economy.

The university derives its right to exist from society (Interview 8, 2010). This would mean a truly entrepreneurial university will not be defensible. One of the

reasons for establishing the university was helping the region to a higher level (Interview 8, 2010). And the university is still important for some of the regional industry. There are for example a lot of companies present at the science park (in which the university plays a mayor role), and this offers a lot of jobs (Interview 5, 2010). Also, more recently during the economic crisis, the University of Twente has offered people from within the regional R&D sector that were at risk of loosing their jobs temporary positions at the university (Mulder, Interview, 2010). This is clearly a gesture that cannot be completely explained from an economic point of view.

It is also the case that economic success seems to be getting less important than a few years ago. A stronger sense of citizenship is emerging. This can be seen as 'professional idealism' (Mulder, Interview, 2010).

The report by the 'Commissie Veerman' urges universities to differentiate (Mulder, Interview, 2010). This might lead to a situation where the university is starting to operate more independently from other universities ('communities outside the network'). They might for example stop offering the same curricula, which universities are currently doing to stay competitive.

External parties are getting more important (Interview 5, 2010). These parties could be viewed as stakeholders in the network surrounding the university. This would also suggest the university is moving to the 'networked university' type.

Researchers are relatively free with regard to the research they choose to undertake (Interview 1, 2010; Van Reekum, Interview, 2010). From this it becomes clear that researchers do not play a strictly economic role.

6.2. Evidence suggesting an entrepreneurial university

Research and education have to be financed, and businesses are getting increasingly important in this regard. Research groups are for example to a large extent dependent on contracts with businesses (Interview 7, 2010; Interview 1, 2010).

It is also true that the university wants to implement some of their solutions via the market (Mulder, Interview, 2010). This makes it impossible to completely abandon the economic plea.

The fact that the university is thinking about cooperating with 'Het Roessingh' might also be prompted by economic motives.

Van Reekum (Interview, 2010) also stated that some degree of entrepreneurship is needed to help bring about good research. Research that is totally free of engagement tends to result in nothing. This also suggests that the economic plea will not be totally abandoned.

The University patents some of its knowledge (Mulder, Interview, 2010). This does not seem to serve society as a whole. The knowledge is not made accessible

to everyone in society, and the university is in a position to use these patents to generate profit. This would be indicative of a university operating from the economic plea.

Professional management seems to be quite important at the moment. Measurements are getting more important, and some management is aimed at for example maximizing the number of students (Interview 4, 2010). This would suggest an entrepreneurial university.

6.3. Total evidence

Sometimes, pressures from both businesses and society seem to have the same result. Because of this, it is difficult to say what is going on. Some of the results tend to be the same because businesses and the university are reacting to the same societal pressures (Interview 7, 2010). The university's involvement with regional business and the plans to collaborate with 'Het Roessing' for example can be explained from both pleas.

It is also true that some activities the university undertakes are best explained from the economic plea. For example: the increase in professional management, the licencing of knowledge, and the increased importance of businesses for financing. At the same time, some of the university's actions are pointing to a networked university. Examples of this are the hiring of R&D people because they were at risk of losing their jobs, and the fact that researchers are relatively free in the research they undertake.

It can be concluded that neither plea accurately describes what the university is currently doing. The university doesn't seem to be returning to the older pleas identified by Grit (2000) either. It has, however, become clear that the economic plea has not (yet) been completely abandoned. Although, because some of the university's actions are not aimed at the direct economic benefit of the university, but are carried out just because they are good for society as a whole, the economic plea is not sufficient to describe the university's actions. There has been some change, but it is not yet clear how this change in plea should be interpreted. The university shows some elements of the interdependent plea, but it is too soon to tell whether or not this is the plea towards which the university is moving.

7. Conclusion

From the section about the nature of change it has become clear that there has been some degree of change in most processes of the educational practice within the University of Twente. Especially the course delivery process seems to have gone through some fundamental changes, and the promotion seems to be largely in line with the change in course development and course delivery. Over all, there seem to have been some fundamental changes. The university thus seems to be starting to react to the 'grand social challenges' by making changes in its education. It is however too soon to say whether or not this is indicative of the start of something new. After all, the number of fundamental changes is still relatively limited.

From the section on stakeholders, it has become clear a considerable amount of stakeholders has been considered when making changes to the educational practice in response to the 'grand social challenges'. Significant stakeholders are the government, businesses, society, students, and alumni. Two of these stakeholders are also definitive stakeholders, namely: the government and society. The scope of this stakeholder involvement suggests that the university is indeed making changes in response to a wide range of societal pressures. This would also indicate the university is starting to evolve in response to the 'grand social challenges'.

From the section about a new possible plea it has become clear that neither plea discussed in this chapter accurately describes what the university is currently doing. It turned out that the economic plea cannot (yet) be completely abandoned, but the interdependent plea does not explain all the university's actions either. There has been some change, but it is not yet clear how this change should be interpreted in terms of a different plea.

The university thus seems to be starting to react to the 'grand social challenges'. This is a reaction in response to a wide range of stakeholders. It is however not certain where this change is leading, and whether or not it is the start of something new. The economic plea is starting to become less applicable, but there does not seem to be a plea that better describes contemporary universities' actions either. Something is happening, but more research will be needed in order to determine what the consequences of this change are.

These changes currently going on in universities, even though the nature of this change is not yet completely clear, also suggest more attention from other organizations to 'grand social challenges' could be justified.

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Interview
Bachelor Thesis
Henri Jansen

UNIVERSITY OF TWENTE.

This interview will be held in order to gain insight into the university's response to the 'grand social challenges' we are facing as a society. Challenges that have been identified are: **climate change**, **resource scarcity**, and **urban sustainability**. Any mention in the subsequent questions of 'grand social challenges', refers to these three challenges.

A. Nature of Change

This part of the interview aims at assessing in what way each of the following processes have changed.

1. Course development

Information owners:

- Teaching staff
- University management

1.1. How does the development of a new course work?

1.2. Have the criteria for developing a new course changed over the last 5 years?

1.3. What has been the role of the 'grand social challenges' in this?

1.4. Who influences course development from outside the university?

1.5. How do they do that?

1.6. Has that changed?

2. Promotion

Information owner:

- University management

2.1. How does the promotion activity of the university work?

2.2. Has this activity changed over the last 5 years?

2.3. What has been the role of the 'grand social challenges' in this?

2.4. To what extent do the changes in promotional activities regarding the 'grand social challenges' represent the actual changes in course development and course delivery?

2.5. Who is targeted by the university's promotional activities regarding the 'grand social challenges'?

3. Attracting funds

Information owner:

-University management

3.1. How does the funding process work?

3.2. Has this process changed over the last 5 years?

3.3. From what resource providers does the university perceive pressure to engage in certain activities related to 'grand social challenges' (if any)?
If the answer is 'none', please continue with point 4.1

3.4. How does the university respond to these pressures, so what activities does the university engage in, and pressures from which stakeholders have been considered in order to come to this decision?
If the answer is 'not', please continue with point 4.1

3.5. How does this response to these pressures show in communications towards different resource providers?

4. Recruitment

Information owner:

-University management

4.1. How does the recruitment process work?

4.2. Has this process changed over the last 5 years?

4.3. Does the university perceive pressure from students to engage in any activity related to the 'grand social challenges'?
If the answer is 'none', please continue with point 5.1

4.4. How is the university responding to this perceived pressure, so what new activities does the university engage in (if any)?
If the answer is 'not', please continue with point 5.1

4.5. How does this response to these pressures show in communications towards students?

5. Course delivery

Information owner:

-Teaching staff

5.1. Has the actual content of courses changed in response to 'grand social challenges'?
If the answer is 'no', please continue with point 6

5.2. In what way has the content of courses changed?

5.3. Is this change in line with the changes in approval criteria addressed in point 1?

6. Alumni relations

Information owners:

- University management
- Alumni office

6.1. How does the University of Twente deal with its alumni?

6.2. Has this activity changed over the last 5 years?

6.3. What has been the role of the 'grand social challenges' in this?

6.4. Have the 'grand social challenges' started playing in the identification and tracking of alumni?

6.5. Does the university's response to the 'grand social challenges' play a role when informing alumni about the university in order to keep them 'attached'?

6.6. Do the 'grand social challenges' play a role when developing programs for alumni?

6.7. Does the university's response to the 'grand social challenges' play a role when trying to increase alumni involvement in the life of the university?

6.8. Does the university's response to the 'grand social challenges' play a role when approaching alumni with opportunities to 'give back' to the university?

B. Stakeholders

This part of the interview is about stakeholder salience. That is the degree to which a stakeholder is important for the university. The stakeholders that are potentially relevant in each of the processes have been identified. Based on the respondent's stories each of these stakeholders are rated on the following attributes in order to determine their degree of salience:

Stakeholder power: "A relationship among social actors in which one social actor, A, can get another social actor, B, to do something that B would not have otherwise done."

Stakeholder legitimacy: "A generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, definitions."

Stakeholder urgency: “The degree to which stakeholder claims call for immediate attention.”

7. Course development

Information owners:

- Teaching staff
- University management

7.1.

The government		
Presence of attribute→	Present	Not present
Attribute		
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

7.2.

The industry		
Presence of attribute→	Present	Not present
Attribute		
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

7.3.

Student		
Presence of attribute→	Present	Not present
Attribute		
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

8. Promotion

Information owner:

- University management

8.1.

The government		
Presence of attribute→	Present	Not present
Attribute		
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

8.2.

The industry		
Attribute	Presence of attribute→	
		Present Not present
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

9. Attracting funds

Information owner:

-University management

9.1.

The government		
Attribute	Presence of attribute→	
		Present Not present
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

9.2.

Organizations / private companies		
Attribute	Presence of attribute→	
		Present Not present
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

9.3.

Non- profit organizations		
Attribute	Presence of attribute→	
		Present Not present
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

9.4.

Charitable board		
Attribute	Presence of attribute→	
		Present Not present
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

9.5.

European community		
Attribute	Presence of attribute→	
		Present Not present
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

10. Recruitment

Information owner:

-University management

10.1.

(Potential) students		
Attribute	Presence of attribute→	
		Present Not present
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

11. Alumni relations

Information owners:

-University management

-Alumni office

11.1.

Alumni		
Attribute	Presence of attribute→	
		Present Not present
↓		
Stakeholder power		
Stakeholder legitimacy		
Stakeholder urgency		

C. View on university

Information owners:

-All

This part of the interview is about current views on what a university is. The stakeholders that are referred to in the next questions are the stakeholders that have been discussed in section B. Based in the respondent's stories, we will assess what statement most accurately describes the current 'idea of a university' within the University of Twente.

12. View on knowledge

- 0 Knowledge is an economic commodity that can be traded on the market.
- 0 Knowledge is a resource that can be exchanged in a network of stakeholders. Not always in return for money.

13. 'Homo academicus'

- 0 The 'Homo academicus' is an entrepreneur.
- 0 The 'Homo academicus' is an actor acting on behalf of the community (university) in a network of stakeholders.

14. Social orientation

- 0 The main role of the University of Twente is an economic role.
- 0 The main role of the University of Twente is promoter of the interests of the network of stakeholders as a whole.

15. Autonomy

- 0 The University of Twente pursues autonomy from politics and the government.
- 0 The University of Twente pursues autonomy from communities outside the network of stakeholders.

16. Control of science

- 0 Science in controlled by professional management and contract research.
- 0 Science in controlled by agreement within the network of stakeholders.

This is the end of the interview.

Thank you for your time!

Appendix 2 --- Examples of research (government)

In this appendix, we give some examples of research related to the ‘grand social challenges’ in which the government plays a role.

- The province of Overijssel is working with the University of Twente on research related to the ‘grand social challenges’. Examples are research in the area of a renewable energy source called biomass and research about healthcare in rural areas (Mulder, Interview, 2010). This is part of the investment agenda of the province of Overijssel. The province wants to become a greener, cleaner, and more sustainable province. They want to create social-economical development in the everyday surroundings, with a focus on sustainable energy and a healthy environment (University of Twente, n.d.(d)).
- The ‘groene campus’ project is partly dependent on funding from government bodies. Government-funders are for example: Enschede, the province Overijssel, VROM, SenterNovem, and the district water board (University of Twente, n.d.(d)). This funding probably brings with it some degree of influence from these government bodies.
- Another project the University of Twente is involved in is the ‘Water Expertise Centrum Oost-Nederland’. The goal is to work on themes like water, energy and food in a sustainable and innovative way. The university is cooperating with other parties on this project. One of these parties is the district water board (University of Twente, n.d.(d)).

References:

Mulder, T. (2010, July). Interview.

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Appendix 3 --- A description of CSTM and IMPACT

CSTM and IMPACT are groups within the University of Twente that conduct research that is related to the 'grand social challenges'. A description of these groups is provided in this appendix.

CSTM describes itself as follows (CSTM, n.d.):

“CSTM - the Twente Centre for Studies in Technology and Sustainable Development at the University of Twente - was established in 1988 to conduct environmental policy research and cleaner production, expanding during the 1990s to a more general focus on technology and sustainable development. Its mandate mirrors the entrepreneurial goals of the University of Twente: to conduct and apply innovative research for the benefit of society. We specialise in governance, emphasising sustainable development, environmental quality, and technological innovation - from both developed and developing country perspectives.”

And IMPACT describes itself as follows (IMPACT, n.d.):

“IMPACT is a research institute that initiates and coordinates research on Energy and Resources through building multidisciplinary teams around ambitious projects and delivering state of the art technological solutions. In the Energy and Resources domain, the institute focuses on:

- Sustainable energy generation.
- Reduction of energy demand and consumption by optimization of products, processes and methods.
- New materials based on renewable resources.
- Reduction of environmental footprints of processes and products.”

References:

CSTM. (n.d.). *CSTM*. Retrieved August 11, 2010, from CSTM: <http://www.utwente.nl/mb/cstm/>

IMPACT. (n.d.). *IMPACT*. Retrieved August 8, 2010, from IMPACT: <http://www.utwente.nl/impact/>

Appendix 4 --- Examples of research (business)

In this appendix, we give some examples of research related to the ‘grand social challenges’ in which companies play a role.

- The ‘groene campus’ project is not only dependent on funding from government bodies. Other funders are for example: Essent and Eneco (power companies) (University of Twente, n.d.(d)). This funding probably also brings with it some degree of influence from these businesses.
- Businesses also play a role in the ‘Water Expertise Centrum Oost-Nederland’. The university cooperates with Arcadis, Eijkelkamp, and Royal Haskoning (engineering firms) on this project.
- The University of Twente is cooperating with ‘het Roessingh R&D’ (Van Reekum, Interview, 2010). If this pans out, it would also play a role in research meeting the ‘grand social challenges’ (University of Twente, n.d.(d)).

References:

Van Reekum, A. (2010, July). Interview.

University of Twente. (n.d.(d)). *Startnotitie groene campus*. Retrieved August 4, 2010, from University of Twente: http://www.utwente.nl/secr/overzichteenheden/Campusmanagement/Groene_Duurzame_Campus/Groene_Campus_startnotitie_def.doc/

Appendix 5 --- Reflection

In this reflection I will comment on my experiences during the research I conducted. I will both look at things that went well, and things that could be improved on.

I have had several appointments with my supervisor(s) during the process of writing this thesis. This way we made sure we all knew what was going on with the research, and agreed on what the next steps should be. I think this was a good way to ensure I was making progress. These meetings resulted in some very useful suggestions regarding literature that could help the research. It also gave us the opportunity to discuss the progress and come up with ways to improve the research.

It turned out to be difficult to complete a bachelor thesis within the prescribed 2,5 months. It took for example quite some time to arrange the interviews. I had to be careful not to plan two interviews simultaneously, and I had to adapt my own schedule to the interviewees' schedules. Only after every interview had been arranged and was conducted, I could start processing the interviews and draw conclusions. This delay could probably have been anticipated. I have however been able to finish most work during the summer vacation, so this has not given any real problems.

I also noticed that it was quite difficult to start the research. At first, I was not really sure where the research was going, and from what angle the problem at hand should be approached. After consulting some literature, and meeting again with my first supervisor, I was able to determine what literature would be used to conduct the research. A more efficient approach could probably have saved some time at this stage.

I have gained a lot of experience in arranging and conducting interviews. In other courses during which interviews were conducted, the interviewees had already been informed about the forthcoming interview. This was not the case with this thesis. I had to assess with whom I wanted to talk, and explain to them why I wanted to conduct an interview. I have contacted 16 potential interviewees, and 8 of them were willing and able to participate. This seems quite reasonable given the fact that the interviews were conducted during the summer vacation.

I have also gained experience in conducting scientific research. Methods from different courses could be applied to relevant theories. A lot of things I learned during the Bachelor of Science programme "Business Administration" came together in this project. This experience should help me successfully completing the master thesis next year as well.

I also noticed that all interviewees were very interested in the research I was conducting, and very cooperative in helping me find the information I needed. This has been of great help, and without this, the results would probably be far less valuable.

My first supervisor suggested keeping track of the potential interviewees and the status of my request by entering all the information into a spreadsheet. This has proven to be very helpful, because I have used this document quite often to see whether or not I was on track to arrange a sufficient amount of interviews. It also gave a nice overview of who had already mailed back, and whose response I was still awaiting. This is an instrument I will definitely use the next time I have to make arrangements with a large number of people. This spread sheet is shown on the next page. Because some interviewees chose not to be referred to, the data has been removed.

