



Winning strategies for internationalisation at Nordic technical universities

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Resume

This study has investigated strategies for internationalisation at technical universities in the Nordic countries and explored why and how some universities are more successful with their strategies. Strategy is defined here as the long-term direction of an organisation, and internationalisation as the ongoing process of integrating an international perspective into the university system to respond and adapt appropriately to a changing external environment. The study investigated the institutional rationales for internationalisation, the stories told in the strategy documents, the importance of leaders, faculty, administration and students for implementation of the strategy and barriers and key components of successful internationalisation.

The strategic work with internationalisation was studied across 27 technical universities in Denmark, Finland, Iceland, Norway and Sweden. Information was gathered from written strategy documents from all 27 institutions; a questionnaire with replies from 15 institutions; and interviews with five leaders of international units during the period November 2015 to April 2016. The exploring strategy model (Johnson et al. 2014) was used as the basis for analysing and evaluating the three elements of strategy, their relations and relative importance.

The strategic work with internationalisation at Nordic technical universities reflects both global trends of competition and the traditional Nordic model of cooperation. Overall, the universities incorporated internationalisation in their strategies in order to increase quality in research and education and to establish strategic partnerships and networks. There is a shift in rationales from a more traditional approach of internationalisation to a new integrated form. The new motivation for internationalisation covers much more than traditional student- and staff mobility. Implementation was found to be very important for making a strategy successful. Concrete action plans can be helpful in order to implement the overall strategic aims. Clear communication and dialogue about the ambitions of internationalisation is important. Especially the top leaders were crucial to make the vision and goals clear all the way throughout the organisation. The institutional culture and identity was also found to be of large importance for implementation of strategic aims for internationalisation.

Sammendrag

Denne oppgave har undersøkt strategier for internasjonalisering ved tekniske universiteter i Norden og utforsket hvorfor og hvordan noen universiteter er mer vellykket med sine strategier. Strategi er her definert som den langsiktige retning av en organisasjon, og internasjonalisering som den pågående prosessen med å integrere et internasjonalt perspektiv inn i universitetssystemet for å kunne respondere og tilpasse seg hensiktsmessig til skiftende ytre betingelser. Studien undersøkte institusjonelle begrunnelser for internasjonalisering, historiene fortalt i strategidokumentene, er betydningen av ledere, lærere, administrasjon og studenter for gjennomføring av strategien og barrierer og viktige komponenter i vellykket internasjonalisering.

Det strategiske arbeidet med internasjonalisering ble studert på 27 tekniske universiteter i Danmark, Finland, Island, Norge og Sverige. Det ble innhentet informasjon fra skriftlige strategidokumenter fra alle 27 institusjoner; et spørreskjema med svar fra 15 institusjoner; og intervjuer med fem ledere av internasjonale enheter i perioden november 2015 til april 2016. Modellen 'Exploring strategy' (Johnson et al. 2014) ble brukt som grunnlag for å analysere og vurdere de tre elementene i strategien, deres forhold og relativ betydning.

Det strategiske arbeidet med internasjonalisering ved nordiske tekniske universiteter gjenspeiler både globale konkurransetrender og den tradisjonelle nordiske modellen for samarbeid. Totalt sett har universitetene brukt internasjonalisering i sine strategier for å øke kvaliteten i forskning og utdanning og for å etablere strategiske partnerskap og nettverk. Det er et skifte i begrunnelser fra en mer tradisjonell tilnærming til internasjonalisering til en ny integrert form. Den nye motivasjonen for internasjonalisering dekker mye mer enn tradisjonell student- og ansatte mobilitet. Implementering ble funnet å være svært viktig for å lage en strategi vellykket. Konkrete handlingsplaner kan være nyttig for å gjennomføre de overordnede strategiske mål. Tydelig kommunikasjon og dialog om ambisjonene til internasjonalisering er viktig. Spesielt den øverste ledelse var avgjørende for å gjøre visjon og mål klare og få de kommunisert ut i hele organisasjonen. Den institusjonelle kultur og identitet ble også funnet å være av stor betydning for gjennomføringen av strategiske mål for internasjonalisering.

Preface

I have been privileged to work with colleagues from many Nordic universities and research institutions over the last 15 years. First as a researcher and Ph.D. student at University of Copenhagen and later as secretary for Nordic Forest Research¹ under the auspices of the Nordic Council of Ministers. In my present position at the international office at University of Stavanger, I function as Norwegian country representative for the mobility charter of NORDTEK, the Network of the Rectors and Deans of the Technical Universities in the five Nordic countries².

This has provided me a great opportunity for observing both similarities and differences between Nordic universities. I decided to use this network of expertise, focusing on why some universities have more success with their strategies for internationalisation than others do within the Nordic region.

Writing the master thesis for the Executive Master of Business Administration (EMBA) at University of Stavanger has been an exciting journey through the strategic ambitions for internationalisation at the Nordic universities. It has been an honour to meet and learn from highly professional and dedicated persons at a large number of technical universities in the five Nordic countries. Thanks to all of you, - this thesis could not have been written without your contributions.

Sincere thanks to my supervisor professor emeritus dr. oecon. Jan Erik Karlsen at University of Stavanger for kind and generous motivation and guidance into the academics of social science, my fellow EMBA-students for enthusiastic discussions, and my workplace for being positive to my study and for providing flexibility in the final stages of the thesis writing. Most importantly: Thanks to my dear family, you are the best!

Katrine Hahn Kristensen

Stavanger, May 18th 2016

¹ <http://www.nordicforestresearch.org>

² <http://nordtek.net/about-nordtek/>

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1. Introduction

1.1 Universities are international(ising)

Universities have always had activities exceeding national boundaries and students and scholars have always been seeking for the best education and research opportunities. At the medieval universities in Europe, Latin was the common language of scholars and faculty and students were seeking research funding and lectures abroad. However, this was an exclusive option, not a mass trend (Hernes 2013), and internationalisation was based on individual initiatives and informal networks rather than a strategic aim supported by formal structures in the organisation (Scott 2011). Now, universities worldwide internationalise, and English has become the *lingua franca* of modern universities. The modern period of strategic internationalisation started after World War 2 with the United States of America setting up of the Fulbright Programme. In 1987, the European Union established the Erasmus programme, which now encompasses more than 4.000 higher education institutions ((HEIs) and has recruited close to 3 million students (European Commission 2013). Organisationally, the Association of International Educators (NAFSA) was founded 1948, the International Association of Universities (IAU) in 1950), and the European Association for International Education (EAIE) in 1989.

Universities are benchmarked and ranked internationally and take pride when their academic staff receive international awards (Hernes 2013). Further, collaborative networks, alliances, consortia and subsidiaries abroad are natural parts of the university structure now. A survey by the International Association of Universities (IAU) (Egron-Polak and Hudson 2014) shows that higher education institutions place emphasis on academic goals in their internationalisation strategies and that the institutions are worried that more competition among higher education institutions will arise as a result of internationalisation. Because internationalisation is seen as a significant mean to achieve quality in research and education, it is likely that higher education will continue to transform at high speed over the next few decades. In Europe, the Bologna Declaration has been a major driver for the recognition and integration of the international dimension in national higher education policy (Van der Wende 2001), and research and mobility funding has become international with the EU Horizon 2020 being the world's largest international research program (80

billion Euro). Finally, the majority of higher education institutions already have or are developing policies to implement the process of internationalisation and have the key elements of supportive infrastructure in place to move forward and monitor progress (Egron-Polac and Hudson 2014). With this new paradigm about the international and global university as the winner (Bartell 2003), it is interesting to investigate how universities approach this new model for internationalisation strategically.

1.2 Global megatrends of internationalisation

Megatrends are probable future scenarios. They emerge over time, and represent strong drivers for social, economic, political and technological changes, and once established, they may last for decades (Karlsen and Øverland 2010, British Council 2013, Kekäli 2013). Megatrends are useful, they say something significant about the probable future and can be used as data and method for strategic adapting to an upcoming development wave (Karlsen and Øverland 2010). Recently, seven global megatrends, which will influence internationalisation of higher education institutions globally over the next 25-50 years, have been identified (Knight 2008, British Council 2013, Kekäli 2013, Calderon 2015):

Shifts in global demographics: India, the Middle East, and North Africa have growth in the younger population, whereas Europe has a diminishing proportion of young age groups entering university (Karlsen and Pritchard 2013). By 2024, it is predicted that four countries (India, China, Indonesia and the United States) will be home to over 50% of the global 18-22 year old population, followed by countries at the African continent (Nigeria, Ethiopia, Egypt, Kenya and South Africa) (The British Council 2013, Gelleni and Guillaume 2015). The increasing and rapid urbanisation of many global growth regions is combined with populations seeking better access to health care and education opportunities.

Economic dynamics: Europe is going through an economic crisis, and university funding will diminish or stagnate due to recession and increased public debt (Karlsen and Pritchard 2013). The BRIC (Brasil, Russia, India, China) economies have slowed, shifting the focus to CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa), a group of emerging economies that are forecast to become increasingly important. With a direct correlation between growth in GDP per capita and tertiary education enrolments, it is expected that

emerging growth economies will witness the steepest rise in gross tertiary enrolment and demand for education services.

Changes to political conditions: The introduction of new policies and legislation, reform agendas and increasing political tension can have a profound effect on national and international education provisioning. In India, the Foreign Education Providers Bill is expected to create large opportunities for providers of transnational education. In Australia, the government is committed to strengthening the country's competitiveness as a leading destination for international students (British Council 2013).

Competition for educational market: As emerging economies develop, greater emphasis is placed upon education as central to aiding progress, empowering individuals and acting as a catalyst for further economic stability. There is a growing educational market in China and developing countries, whereas the demand for education in Europe will not necessarily increase much unless effort is made to find growing market segments.

Digital technology: The digital technology revolution of education has already begun through the packaging of Massive Online Open Courses (MOOC) and the opportunity to capitalise on the big data they capture that gives guidance to future pedagogical format. Educational technology will progress the way the world teaches and learns and may both challenge and add to traditional forms of instruction (British Council 2013).

Global workforce demand: Many industries are experiencing a shortage of skilled workers and the graduates that are being produced are not meeting the needs of industry. Whilst many developing economies are investing heavily in education, China and the Middle East given as examples, the gap will take some time to close. When education and business do not coordinate, education cannot adapt (British Council 2013).

Changes in student and youth culture: The expectations of higher education by new student populations and society are changing. Educational exchanges are one of the most powerful and long lasting influences on attitudes towards national culture, therefore investment in student and academic exchange is seen as a very important. Student choice of one study destination over another is greatly influenced by a nation's culture and the potential to experience living and studying within it. The number of Chinese students studying in the

United States jumped rapidly from 2010 to 2012, with the cultural influence of the United States on young people in China as explanatory factor.

It is anticipated that these megatrends will influence higher education globally in a number of ways. Study abroad will continue, with long-term growth in the number of students enrolled outside their country of origin (Gelleni and Guillaume 2015) and short-term exchanges (e.g. Erasmus+ programme) will be strengthened as governments, enterprises and students realise the gains of exchange-experiences (soft skills, culture). Dominant countries of international education are likely to remain competitive, but may expect fiercer competition from new higher education systems in China, Malaysia, Singapore, and South Korea (Calderon 2015, Gelleni and Guillaume 2015). In emerging and developing countries, higher education participation rates will continue to rise and new corridors of study abroad activities, e.g. bilateral border-mobility, mobility driven by diaspora populations and development of regional hubs for higher education because of lower costs for mobile students (Gelleni and Guillaume 2015). Research and higher education will be more greatly integrated with related industries and this will influence student destination choices. Research will be driven more by international cross-industry collaboration, and the concentration of research will influence destination choices for doctoral students and research capacity for many institutions. Strategic partnerships will become more important, greater and more complex, the MOOC'isation of higher education will settle with partnerships established and MOOCs will enhance educational quality and be an additional learning source. Accreditation and recognition of qualifications will be standardised and homogenised among partners and countries with trade-in-service agreements. This will boost international student mobility, however, price, branding and reputation will still influence the students' final decision on destination.

1.3 Trends at Nordic universities

The global mega-trends will influence Nordic universities, some in a long time-perspective, others are already there. An example is the high interest and competitive pressure at master programmes conducted in English at Norwegian universities, where higher education is free. With strategic funding for partnerships, most governments in the Nordic countries aim to steer the research and educational cooperation and partnerships to countries with political

or economic interests. At the same time, European and national politics and societal changes may influence the strategic work at Nordic universities more directly and in a much shorter time perspective. To a large extent, institutional policy and strategic planning in Western Europe is steered by national politics with the ministry setting the main direction and policies for a certain period of time, and the universities transmitting it into their organisation by developing their own institutional strategy plans (Zaharia 2002). However, policymaking is to an increasing extent being influenced by intergovernmental agreements such as the Bologna process (de Wit 2002).

The academic rationale of quality improvement is still a very important argument for internationalisation policies, but internationalisation is increasingly driven by economic rationales related to the international competitiveness of the system and/or to the export of higher education programmes and services in Europe (Van der Wende 2001). In the Nordic countries, there is a growing interest in and importance of the economic dimensions of internationalisation in higher education (Stensaker et al. 2008). This is a new driver in the Nordic region, which traditionally emphasises cultural and social motives of higher education. A recent case study covering universities in all five Nordic countries (Stensaker et al. 2008) found an increased focus on the expected economic contributions of incoming international students as well as a general view that national students who study abroad are more valuable for the national economy on return than students who have 'only' studied at a their home university.

Institutional cooperation in research and education has a long tradition in the Nordic countries and is connected to historical, cultural and political ties. Free mobility of students between the Nordic countries has been a practice for a long time without formal agreements, but when special study programmes became popular, pragmatic regulations were introduced (Jensen 2013). The Nordic languages creates natural 'educational communities' within the region (Maassen and Uppstrøm 2004), and institutionalised cooperation has been in place for many years, e.g. NORDTEK since 1933 and the Nordplus-exchange programme since 1988 (Andrae and Nicolaou 2008). However, Nordic programmes are now seen as less important than the EU programmes, but have the advantage of being less bureaucratic (Maassen et al. 2004). The Scandinavian countries share a traditional approach to higher education policy with an emphasis on equality in access and (until

recently) no fees. In terms of emerging 'Nordic' trends, albeit differences between countries, the Nordic governments increasingly view higher education as a tool for overall economic and industrial development, and have become much more active in setting the aims and strategies for internationalisation. Now, the region is experiencing some shifts in policy development on internationalisation. National policies emphasise that the institutions should actively promote the internationalisation of their activities and some governments are focused on reducing the imbalance between outgoing and incoming students.

In the near future, the Nordic countries will host more than 100.000 international degree-seeking students (Guhr and Furtado 2015). The national strategies for fee-paying of international students have diversified over the last 10 years and the international tuition fee is an example of how internationalisation is viewed. In Denmark (2006) and Sweden (2011) the government decided to introduce tuition fees to students from outside the European Union (EU) and the European Economic Area (EEA). Finland currently has no international tuition-fee in regular degree programmes, but the government has proposed to introduce a minimum annual fee in 2017. Norway has experienced two political cycles of fee discussions, only to shelve the project for now. Thus, Iceland remains the only country with a persistent no-fees approach (Guhr and Furtado 2015). There seems to be three strategic considerations behind the introduction of international tuition fees; 1) the potential financial contribution from degree-seeking non EU/EEA students, 2) the political optics and discussions about the welfare state model, where international students are increasingly assumed to be able to contribute the full cost of their education and 3) the need to properly price the market value of a master's degree from a Nordic university (Guhr and Furtado 2015).

Competitiveness, as a part of the strategy for internationalisation has also increased. A study of strategy plans from five leading Nordic universities showed that the need to become even more excellent institutions to be able to compete internationally is a major strategic issue (Stensaker and Vabø 2013). In addition to excellence, the strategies point to the link between staff recruitment and the ability to perform well in international rankings (Stensaker and Vabø 2013).

Internationalisation is being increasingly formalised, centralised and professionalised at Nordic universities (Stensaker et al. 2008) e.g. by establishment of offices for

internationalisation, institutional plans for internationalisation, and institutional routines on exchange agreements and research funding applications. Further, the reasons for and activities within internationalisation have moved from an 'old' individual and informal scheme, where motives primarily were academic and cultural to a 'new' scheme, where internationalisation is institutionalised and standardised and political and economic arguments have been added to the traditional academic perspective on internationalisation (Figure 1). Stensaker et al. (2008) found that 'old' forms of internationalisation did co-exist and overlap with 'new' forms thereby influencing the potential impact of internationalisation as 'old' and 'new' activities are not necessarily coordinated, with e.g. new initiatives taken at the central level of the organisation but with much autonomy remaining with the individual academic with respect to implementation.

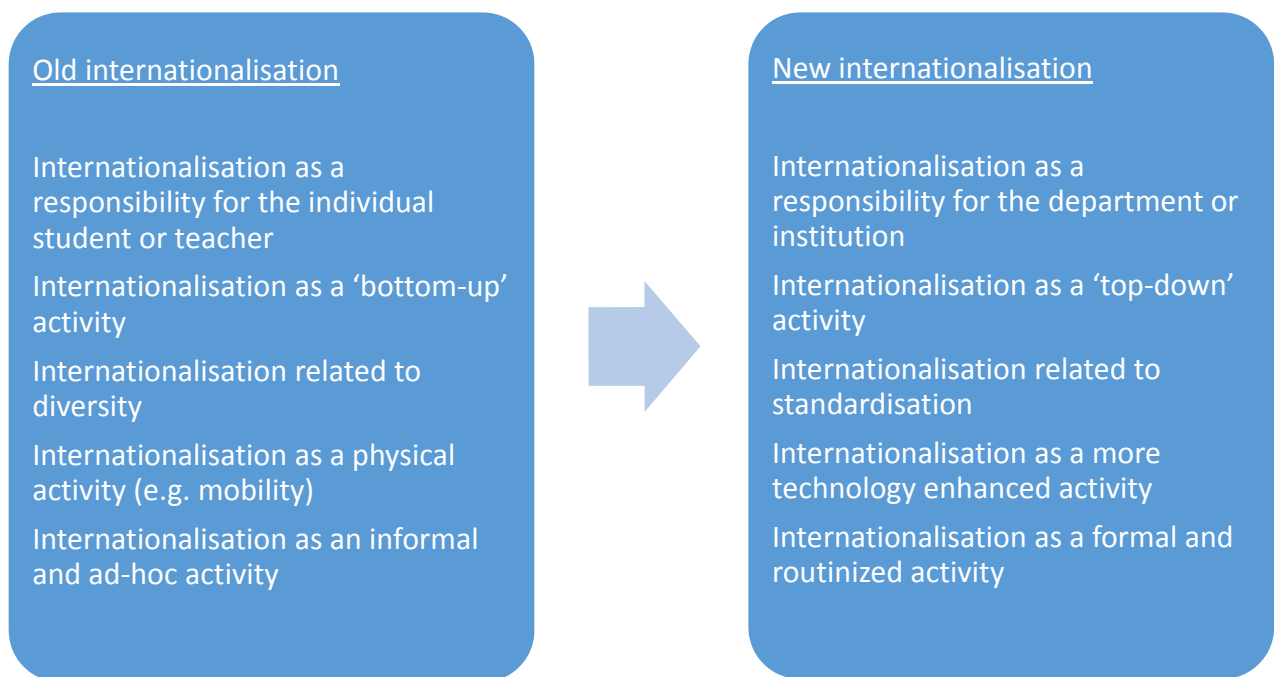


Figure 1. The transition of reasons and indicators of internationalisation in higher education. The academic, social/cultural reasons often manifested in 'old' forms of internationalisation whereas the political and economic reasons often manifested in 'new' forms of internationalisation. From Stensaker et al. (2008) p. 4.

1.4 Strategic aspects of internationalisation

With universities being large and diverse organisations navigating in a political climate, strategies are important. Strategy is about how to get from where we are at present to where we want to be in the future. Thus, a strategy is to follow the vision and purpose of the organisation, identify and explore opportunities, and anticipate and respond to threats (Gill

2011, p. 203). However, the organisation must not only formulate but also implement its strategy effectively before the strategy can be of any specific value. Implementation is here defined as putting the formulated strategy to work. However, it is known that various barriers, i.e. obstructions to the successful implementation of the strategy can arise, and this is a particular challenge to management (Vracking 1995, Heide et al. 2002).

Universities are large, complex, hierarchal and often tradition-bound organisations. The task of successfully developing and implementing a strategy for internationalisation, which reflects the long-term direction of an organisation (Johnson et al. 2014, p. 3), is therefore an ongoing process. Knight (2008) described strategies as the most concrete level in university management and divided the content into *academic* and *organisational* initiatives. However, the institution must not only formulate but also implement its strategy effectively before it can be of any specific value. Based on this, a successful strategy is defined as an appropriate strategy that is successfully implemented.

It is known that various barriers, i.e. obstructions to the successful implementation of the strategy can arise, and this is a particular challenge to management (Vracking 1995, Heide et al. 2002). Implementation is here defined as putting the formulated strategy to work. Heide et al. (2002) listed a number of aspects of the organisation that may affect the success of strategy implementation: 1) information systems; 2) learning; 3) allocation of resources; 4) formal organisational structure including control systems; 5) personnel management; 6) political factors; and 7) organisational culture. Planning documents and formalised strategies are expressions of the strategic work concerning internationalisation at the educational institutions. Meanwhile, strategic documents alone do not make the institutions international. The study will take a closer look at barriers and key components for implementation of strategies.

1.5 Research questions

This study will focus on strategies for internationalisation at technical universities in the Nordic countries³ and explore why and how some universities are more successful with their strategies. The argument for studying this cohort of universities is two-fold:

³ Denmark, Finland, Iceland, Norway and Sweden

The Nordic countries are small players at the global research and higher education arena, but have ambitions of increasing research productivity, impact and innovation. Also, there is a political ambition to increase outward mobility (Centre for International Mobility (CIMO) et al. 2013). Because of the relatively small cohort, it is possible to study how and why universities which are within the same sector and same region, vary in performance and competitive advantage, especially in an era, with a shift in paradigms for internationalisation from co-operative to competitive approach (deWit 2007).

Many polytechnics and universities experience that engineering students are less likely to go abroad for an international semester than other student groups (Centre for International Mobility (CIMO) et al. 2013), and that lecturers of engineering students have more negative attitudes towards mobility than lecturers on average (Frølich et al. 2014). This is in contrast to the international work environment most students experience once they have graduated. Graduates from polytechnic universities are often employed by multinational companies, they work on international projects, and use universal engineering skills. This paradox is reported from several universities in the Nordic region, e.g. at the session “How to get engineering students mobile?” at the 26th EAIE-conference on international education⁴ (2014), Centre for International Mobility (CIMO) et al. (2013) and Frølich et al. (2014).

The trends and paradoxes described above form the basis for the overall research question: *What defines a winning strategy for internationalisation at Nordic technical universities?* By focusing on the implementation of intended strategies, the overarching question is supplemented by four more concrete study questions:

- 1) What is the institutional rationale for internationalisation?
- 2) What does the articulated strategy tell us?
- 3) Leaders, faculty, or students - who are most important for implementation of the strategy?
- 4) What are the barriers and key components of successful internationalisation?

⁴ <http://www.eaie.org/home/conference/past-conferences.html>

1.6 Limitations of the study

The study is limited to technical universities in the Nordic countries, which are NORDTEK members, due to the direct access to informants and time constraints. This means that a number of Nordic technical universities or university colleges, which are not NORDTEK members are excluded from the study. A sample size of 27 institutions was considered ample to interpret the findings of the study. The culture, history and organisational structure of technical universities might be different from those of broad universities, e.g. the attitude of students towards mobility and the number of institutional partnerships. However, many of the strategic ambitions and challenges with implementation are common across university types. The application of the findings outside the Nordic region might be limited, as the political environment, organisational structure and economic conditions (for both students and universities) are different.

With access to information from the full population of universities in the network, the study can be seen as a complete case study. However, the results cannot be directly transferred to universities or other higher education institutions outside the Nordic region, or universities with a different scope than the technical disciplines.

The study is not a 'league table' of the Nordic technical universities and will not make rankings or statements about which university is the 'best' in the Nordic countries, but aims to provide a thorough perspective on strategies and their implementation, by showing variations between institutions and highlighting the key elements of successful strategies.

2. Theory on strategies and internationalisation

2.1 Theoretical perspectives on strategy

In this study, the definition of strategy as *the long-term direction of an organisation* (Johnson et al. 2014) is applied. This is a more comprehensive definition than the definitions by some of the leading strategy theorists, e.g. Porter, who focuses on deliberate choices, differences and competences (Johnson et al. 2014, p. 3). The definition allows for both the deliberate and logical strategy as described by Chandler (Chandler 1962, Johnson et al. 2014 p. 4), where strategy is a logical flow from the determination of goals and objectives to the allocation of resources and the more incremental or emergent pattern described by Mintzberg (Mintzberg and Waters 1985, Johnson et al. 2014 p. 4) where the competitive strategy is about being different and deliberately choosing a different set of activities to deliver a unique mix of value. By using the definition by Johnson et al. (2014) it is also possible to include both strategies that give emphasis to difference and competition and strategies that are based on cooperation or even imitation. The *long-term* component of the definition means that the strategy covers several years or maybe even decades, looking at both 1) current activities, 2) emerging activities and 3) future viable options. The *direction* component of the definition means that strategies follow a long-term direction or path according to the long-term objectives of the organisation. The *organisation* part of the definition includes both internal and external stakeholders and considers the people and groups involved and their different interests and views (Johnson et al. 2014, p. 4-7).

The deliberate strategy of an organisation should be summarised in a strategy statement covering 1) the fundamental goals (mission, vision, and objectives), 2) the scope of activities, and 3) how the organisation will achieve the objectives by use of its particular advantages (Collis and Rukstad 2008, Johnson et al. 2014). According to Collis and Rukstad (2008), the value of rhetoric should not be underestimated, and they advise that 35 words is ample for a statement and that a short statement keeps focus on the essentials and makes it easier to remember and communicate. Because words do lead to action, this can have a substantial impact on a company's success (Collis and Rukstad 2008), and if the management is unable to communicate the strategy in a meaningful manner, the strategy will probably not be implemented (Heide et al. 2002). The formulated strategy must be implemented before it

can be of further value to an organisation. Implementation is putting the formulated strategy to work, but barriers or obstructions to the successful implementation of the strategy can be a challenge to management (Guth and Macmillan 1986, Vrakking 1995, Heide et al. 2002).

The three-part 'exploring strategy model' by Johnson et al. (2014), which emphasises the interconnected nature of strategy is used as base model in this study. The three elements of the model are 'strategic position', 'strategic choices' and 'strategy in action' (Figure 2).



Figure 2. The exploring strategy model (Johnson et al. 2014 p. 11), which includes the understanding of the strategic position, assessing the strategic choices and managing strategy in action.

In the exploring strategy model, the *strategic position* concerns the organisations resources and capabilities, its mission, vision and objectives, and organisational culture. Much of the information about the strategic position can be found in strategy documents and interviews with key stakeholders. The *strategic choices* includes both the strategic direction and choices about methods for pursuing the strategy. The third element about managing *strategy in action* is about how strategies are formed and implemented with emphasis on the practicalities of managing. Applying the model to strategies for internationalisation means that the *strategic position* can be found in strategy documents for internationalisation, the *strategic choice* is about the institutional motivation for internationalisation and priorities linked to this and the *strategy in action* is reflected in the strategy development process, organisation, leadership and leading change, communication and how people are involved in

practice. The exploring strategy model will be used as the basis for analysing and evaluating the three elements of strategy, their relations and relative importance.

2.2 Implementation of strategy

With the research questions having focus on how the strategy is successfully implemented and the importance of management, theory on leadership becomes relevant. Marchington and Wilkinson (2012) focus on going from intention to implementation (Figure 3).

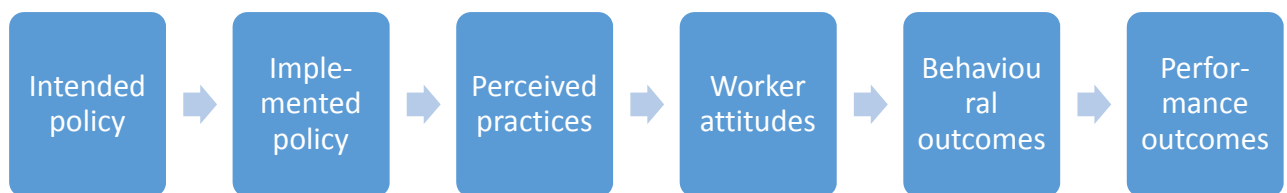


Figure 3. From intended policies to implemented practices. A graphic representation of the human resource management performance link. From Marchington and Wilkinson (2012 p. 417).

The fit between intentions and implementation can be anything from loose to a recognised track, depending on the organisation and leadership. With universities being large, complex and somewhat autonomous organisations the effect of this link will probably depend strongly on the impact of the management of the organisation. With a weak fit, the task of change management and planned change can be difficult. Further, with universities applying both top-down and bottom-up approaches for developing and implementing the strategy, the interaction between institution and individuals, and the organisational culture become important. The influence of history and culture on the organisational performance can be described by the concept of path dependency, where past events and decisions have made ‘policy paths’ with a lasting effect on later strategic decisions (Johnson et al. 2014, p. 143). Thus, universities, which already have experience with and user expectations about internationalisation, may use their capabilities to build a strategy around it. New and/or young institutions without this base have to create a new path, and to not have the competitive advantage of past experience and culture. With this theory, it is assumed that strategic management of universities is path-dependent.

2.3 Internationalisation in a university perspective

Internationalisation can be described as “the process of integrating an international perspective into a college or university system” (Ellingboe 1998, in Bartell 2003 p. 199). In more detail, Ellingboe (1998, in Bartell 2003 p. 199) characterises it as an “ongoing, future-oriented, multidimensional, interdisciplinary, leadership-driven vision that includes many stakeholders working to change the internal dynamics of an institution to respond and adapt appropriately to an increasingly diverse, globally focused, ever-changing external environment” (Ellingboe 1998, in Bartell 2003 p. 199). This definition makes the foundation for the analyses of internationalisation strategies in this study. Further, the many components of internationalisation can be categorised under the three headlines education, research and institutional support (Bartell 2003), some of which are listed below:

Education

- Available, affordable, accessible and transferable mobility programs for students
- In- and outbound student mobility
- International student participation
- Curriculum change (international semesters/full programs in English)

Research

- Faculty members’ international involvement in activities with colleagues, research sites, and institutions worldwide
- In- and outbound staff mobility
- International partnerships

Institutional support

- Mobilising financial, human and technological resources for internationalisation
- Contribution of university development projects to internationalisation
- University and faculty leadership
- Presence and integration of international students, scholars and visiting faculty into campus life
- International co-curricular units (e.g. residence halls, conference planning centres, student unions, career centres, cultural immersion and language houses, student activities and student organisations)
- Internationalisation at home (e.g. academic staff, incoming exchange students, international full-degree students, administrative staff).

2.4 Assessment criteria for successful internationalisation

Success with internationalisation has many different dimensions, and a strategy can be successful in many ways. Is it well written and anchored in the organisation? Is it thoroughly implemented at all levels in the organisation? Does it live up to the targets set in the strategy? Is it successful internally or externally? Is it economically successful? Is it sustainable in the long run? Is it resilient? A number of organisations, associations, public bodies and individuals have suggested a broad spectre of methods for assessing strategies for internationalisation at higher education institutions or ranking universities for their international outlook.

The Times Higher Education World University Rankings (2016) include students, staff and research as the three dimensions in the ranking of international outlook: Students (International-to-domestic-student ratio); Staff (International-to-domestic-staff ratio); and Research (Ratio of research journal publications with international co-authors).

Another example is the Erasmus Charter for Higher Education in Europe, which provides a quality framework for European and international cooperation activities at higher education institution within Erasmus+ (European Union 2013, European Commission 2016). Erasmus+ supports three Key Actions targeting international cooperation: Mobility: International credit mobility of students and staff and Erasmus Mundus Joint Master Degrees (Key Action 1); Cooperation and partnerships: Capacity-building projects in higher education (Key Action 2); and Support to policy dialogue: Networks, alumni association, policy dialogue, promotion events etc. (Key Action 3).

The assessment criteria from some of the most dominant organisations dealing with assessment of internationalisation are compiled in Appendix I. The appendix lists assessment criteria from Association of International Educators (NAFSA), The Centre for Higher Education Development (CHE), American Council on Education (ACE), European Consortium for Accreditation (ECA), European Quality Improvement System (EQUIS) as well as Times Higher Education and Erasmus+. Similar to de Wit (2010), this comparison revealed that the checklists include more or less the same categories for institutional strategies. Table 1 is based on the synopsis of assessment criteria in Appendix I and uses Knight's (2008) division into four dimensions of success with internationalisation, two organisational and two

academic. The four dimensions of assessment of strategic success in Table 1 are applied in the analysis below.

Table 1. The four dimensions of an assessment of a successful strategy for internationalisation used in this study. The table is based on the compilation in Appendix I.

Organisational	Strategy	The articulated and intended strategy and associated documents as regards internationalisation.
	Management	Processes and resources available for the implementation of the strategy Organisational structure and administrative and board-level support for internationalisation.
Academic	Research	Composition, competences and experience of academic staff. Recruitment Activities supporting internationalisation (research, mobility, networking, publishing) Cooperation, networks, partnerships
	Education	Composition, language ability and experience of students. Recruitment, mobility programmes, placements and degrees, intercultural classrooms, and services provided to the students, education abroad Content and structure of the curriculum, intercultural learning outcomes, internationalisation of programmes

2.5 Rationales for internationalisation

To understand how institutions are motivated for working strategically with internationalisation, it is useful to look at the behind-lying rationales. Rationales may cover many dimensions and concern economic motives, be guided by external factors like national strategies and policies, or be linked to internal ambitions, e.g. improvement of quality in education and research, and have focus on both short-term and long-term benefits. Institutions have different guiding missions, values, priorities, and rationales, which are reflected in their strategies for internationalisation. These differences influence the approach taken to internationalisation. The six different, but not mutually exclusive rationales to internationalisation at the institutional level (Knight 2008) will be used in the analyses of rationales for internationalisation in this study. Together, this forms a framework for evaluating the dominant features of the institutional approach to internationalisation and the desired future direction as well as the consistence or complementarity of the rationales and values driving the efforts to internationalise.

Activity	Internationalisation is described in terms of activities like study abroad, curriculum, academic programs, international students, institutional linkages and networks, development projects, and branch campuses.
Outcomes	Internationalisation is presented in the form of desired results such as student competencies, increased profile, and more international agreements, partners, or projects.
Rationales	Internationalisation is described with respect to the primary motivations or rationales driving it. They can include academic standards, income generation, cultural diversity, and student and/or staff development.
Process	Internationalisation is considered to be a process in which an international dimension is integrated in a sustainable way into the three primary functions of an institution: teaching/learning, research, and service to society.
Ethos	Internationalisation is interpreted as the creation of a culture or climate on campus that promotes and supports international/intercultural understanding and focuses on campus-based or “at home” activities.
Abroad/crossborder	Internationalisation is seen as the crossborder delivery of education to other countries through a variety of delivery modes (face to face, distance, e-learning, etc.) and through different administrative arrangements (franchises, twinning, branch campuses, etc.).

The ‘Activity’, ‘Outcomes’ and ‘Rationales’ motivations emphasises program initiatives and expected results of internationalisation and may link to the ‘Old’ form of internationalisation (Figure 1), where physical and measurable activities form a large part of the internationalisation efforts. The ‘Process’ and ‘Ethos’ motivations focus on the three primary functions of universities and indicates that internationalisations is an institutional responsibility, as described for the ‘New’ form of internationalisation (Figure 1). Also the ‘Abroad/crossborder’ may have stronger links to the ‘New’ form of internationalisation, as it is based on technology-based activities and institutional initiatives.

3. Research methods and materials

3.1 Study object

The study concerns the corporate-level strategies for internationalisation at the member universities of NORDTEK - Network of the Rectors and Deans of the Technical Universities in the five Nordic countries. NORDTEK members are technical universities with advanced engineering up to the Master's level and PhD in a technical research field. NORDTEK has 27 member universities in Denmark, Finland, Iceland, Norway and Sweden (Figure 4, Table 2, Appendix II), which are analysed here. The universities all have strong focus on technical sciences (Piro 2011), but represent a wide range of settings: Student population (3.500 - 45.000), year of establishment (1477 – 2010), ownership structure (public, private, foundation), focus (regional – national), polytechnic or multi-faculty structure, ranking (unranked - top-100 globally), location (capital – regional), educational approach (interdisciplinary - problem-based) and overall profile (elite, business-oriented, innovative, entrepreneurial, e-learning, or industry collaboration) (Appendix II).

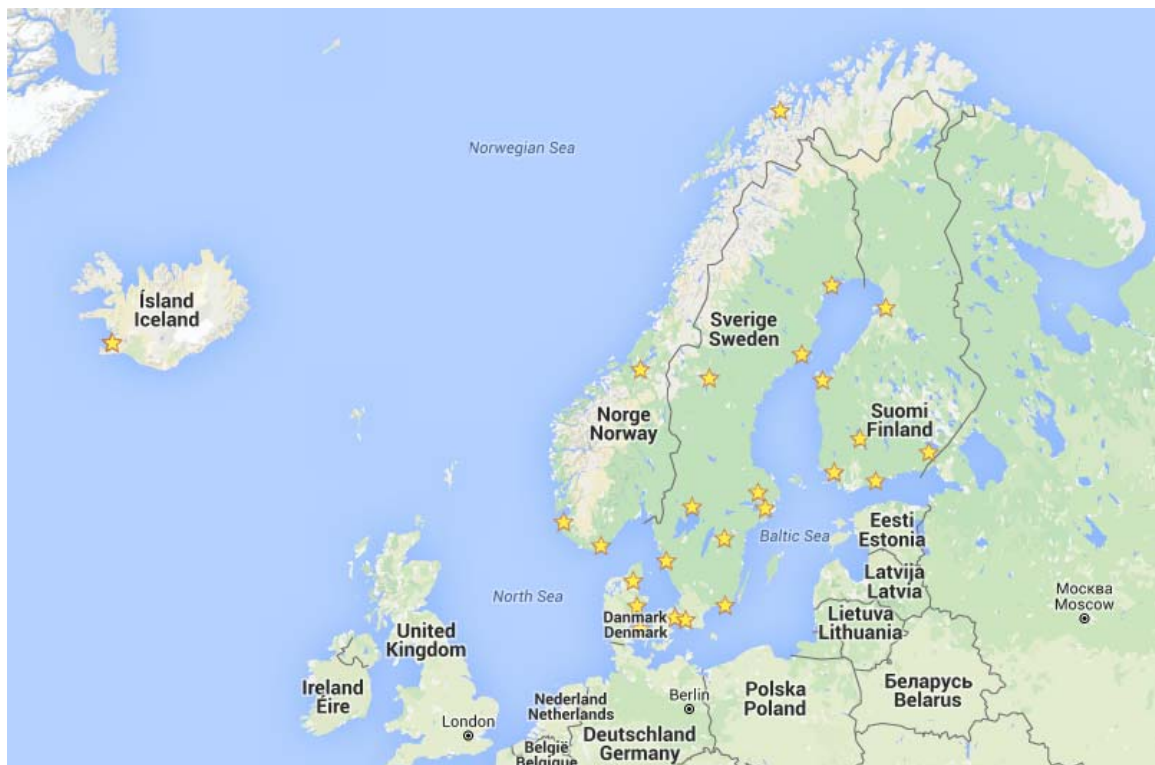


Figure 4. The 27 NORDTEK universities cover all five Nordic countries: Denmark (4), Finland (7), Iceland (2), Norway (4), and Sweden (10). Only the main campus area of each university is depicted in the map. Source: Google maps (<https://www.google.no/maps/@63.3694365,9.1649681,3z?hl=da>) 26.01.2016.

Table 2. List of the 27 universities in the study and the available input to the analyses. (+) indicates that the questionnaire was partially completed.

Country	University	Acronym	Strategy	Questionnaire	Interview
Denmark	Aalborg University	AAU	+	+	+
	Aarhus University	AU	+		
	Technical University of Denmark	DTU	+		
	University of Southern Denmark	SDU	+	+	
Finland	Aalto University	Aalto	+	+	+
	Lappeenranta University of Technology	LUT	+	+	
	Tampere University of Technology	TUT	+	+	
	University of Oulu	Oulu	+		
	University of Turku	UTU	+		
	University of Vaasa	UVA	+		
	Åbo Akademi University	ÅAU	+		
Iceland	Reykjavik University	RU	+	+	
	University of Iceland	HI	+	+	+
Norway	Norwegian University of Science and Technology	NTNU	+	(+)	+
	University of Agder	UiA	+	+	
	University of Stavanger	UiS	+	+	
	UiT The Arctic University of Norway	UiT	+	+	
Sweden	Blekinge Institute of Technology	BTH	+	(+)	
	Chalmers University of Technology	Chalmers	+		
	Karlstad University	KAU	+	+	
	KTH Royal Institute of Technology	KTH	+		
	Linköping University	LiU	+		
	Luleå University of Technology	LTU	+		
	Faculty of Engineering, LTH, Lund University	LTH	+		
	Mid Sweden University	MIUN	+	+	
	Umeå University	UMU	+		
	Uppsala University	UU	+	+	+

3.2 Study method

The study is based on the exploratory research method in which the key variables of the study are not defined prior to the study, but will be identified throughout the period of data collection and analyses (Neuman 2014). The explorative approach will not provide definite answers to a specific research hypothesis, but helps identifying key issues and key variables within the overall objectives of the study, by addressing the ‘What...’ questions (ref. ‘1.4 Research questions’). This requires a flexible approach, where all sources of information are explored (Neuman 2014). Most exploratory research uses qualitative data, but some studies use quantitative techniques. Methodologically, the study is primarily qualitative, which is a useful method when it comes to defining e.g. approaches, and studying key person’s attitudes, but quantitative data is used where applicable and available. The study examines 27 cases or units, where each university is considered a case within the population of Nordic

technical universities. Case study research is here understood as an in-depth examination of an extensive amount of information about a group of cases for one period (Neuman 2014 p. 42).

The core of the study is three qualitative analyses of strategies for internationalisation; 1) discourse analyses of the content and meaning of the organisational strategy documents, 2) a questionnaire on how internationalisation is experienced by academic officers, and 3) interviews with leaders of international activities. By triangulation (Figure 5), where more than one method to gather data is involved, the credibility and validity of the results increase (Neuman 2014). The crosschecking increases the confidence with a result, when different methods lead to the same conclusions and helps overcome inherent biases that may arise from a single method study. Together the three methods helps answering the overarching research question of what defines a winning strategy for internationalisation at Nordic technical universities. The discourse analysis primarily focuses on study questions 1) the institutional rationale of internationalisation and 2) what the strategies actually tell us. The questionnaire and interviews will provide two diverse perspectives on study questions 1) the institutional rationale of internationalisation and give insight to answer the two last study questions about 3) implementation of the strategy and 4) what barriers and key components are most important for successful internationalisation.

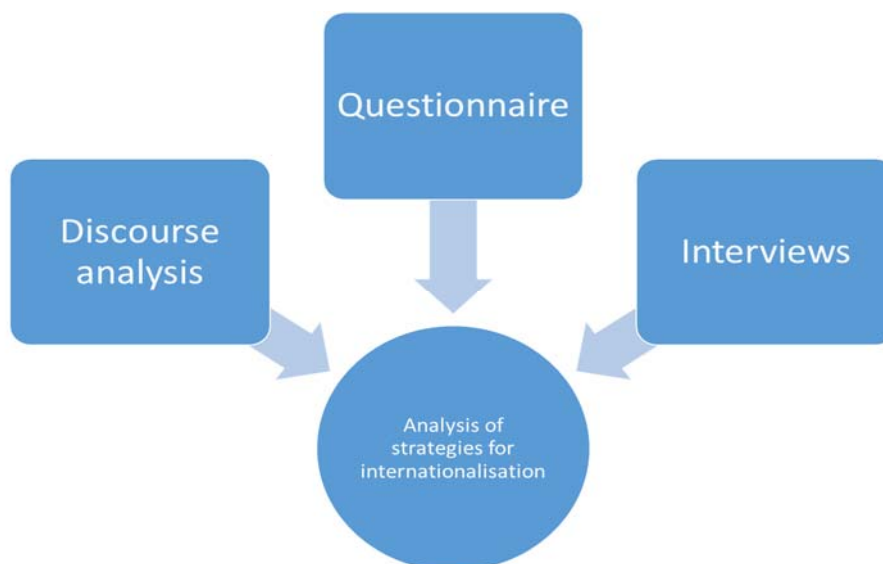


Figure 5. Triangulation of data. The study is based on three different methodological approaches: A discourse analysis of the content and meaning of the strategies, questionnaire, and interviews. Hereby the object (strategies for internationalisation) is observed from three different perspectives.

3.3 Discourse analysis

The content of the written strategies for internationalisation at the 27 NORDTEK universities were investigated by use of a discourse analysis (Schneider 2013). The aim of the discourse analysis is to study the content and meaning of the text in the strategies. The analysis in this thesis leans on Jaynes (2015), who summarises a discourse as a systematic and organised grouping of statements, which articulate the meanings and values of an organisation, thus looking at language change as central to strategic change. Here, the output of the discourse analysis is an overview of how the universities construct their arguments, what statements they establish and how this fits into a wider picture of internationalisation (Schneider 2013). For all 27 universities, the general strategies as well as available specific strategies for internationalisation and/or action plans for internationalisation were downloaded and saved as pdf from the universities external websites November 2015. The following text analyses were done:

- The frequency of the words ‘international’, ‘global’ and ‘europe’/’eu’ and their inflections was calculated as a proportion of the total number of words in the strategy.
- All words written in connection with ‘international’ were noted, e.g. for ‘international ambitions’ the word ‘ambition’ was noted and grouped according to the six rationales for internationalisation by Knight (2008).
- The strategies were scanned for statements that point to certain motives for internationalisation. Paragraphs and passages describing motives for internationalisation were noted in tables.
- The strategies were scanned for words and statements that link internationalisation with the management-, research- and educational dimension of the strategy, according to the assessment criteria listed in appendix III.

For strategies only available in Swedish, the analyses were based on the equivalent Swedish words. Text analyses were done by use of ‘find’ function and word counts of the strategy documents. In addition, the layout and target groups (internal/external) for each strategy was analysed and added to the overall picture of the arguments and meaning of the strategies.

3.4 Questionnaire

In order to obtain insight in the content, organisation and implementation of strategies for internationalisation, a questionnaire was sent to respondents responsible for administration of internationalisation at each university February 25th 2016. A reminder was sent out March 4th, and the survey was closed March 31st. The questionnaire included closed and multiple-choice questions covering the following areas:

- Background information on organisation for internationalisation
- Strategy and action plan for internationalisation
- Usefulness of strategy for internationalisation
- Success with internationalisation
- Embeddedness of strategy for internationalisation
- Motivation of management, staff and students for internationalisation
- Institutional motives for internationalisation
- Implementation of internationalisation
- Outcomes of internationalisation
- Activities, which are part of internationalisation

The questionnaire contained 18 questions relating to the research questions of the study (appendix IV), and it was estimated that respondents could answer the questions in in 10-15 minutes. The structure of the questionnaire follows the subdivision of the research question of the study. In order to overcome the bias at University of Stavanger, where I work, the questionnaire was sent to a person in a different position, but with similar insight in the themes of the questionnaire. The questionnaire was designed in SurveyXact (www.surveyxact.dk) (Rambøll 2013, Rambøll Management Consulting 2015), which is a tool for production, distribution and analysis of surveys and entries that all employees and students at University of Stavanger have access to. The questionnaire was conducted anonymously; a function available in SurveyXact, where the user cannot identify which respondent has given the answer. When the user is working with an anonymous survey, SurveyXact blocks for access to a respondent's answer and the user cannot see the email address or respondent key (Rambøll Management Consulting 2015). By 1) using the anonymous function and 2) the questionnaire not containing questions about identifiable information, it was concluded that

the study is not subject to notification to Data Protection Official for Research (NSD)⁵. For the design of the questionnaire, the guidelines of Bradburn et al. (2004) were followed.

In total, 15 respondents out of 27 answered the questionnaire, with 13 respondents completing the questionnaire and 2 respondents filled the questionnaire partially. The remaining 12 respondents did not answer. The 15 respondents representing 15 different universities from all five Nordic countries, and the response rate was 48% for completed questionnaires, and 56%, including the partially completed questionnaires.

3.5 Interviews

To further explore the relationship between strategy, implementation and successful results, and understand the relationships revealed by the discourse analysis and questionnaire, a number of structured interviews with both closed and open-ended questions were conducted (Appendix VI). Five universities were selected for the interviews, one from each of the five Nordic countries. National differences are expected to be reflected in the interview, e.g. different mobility rates (in and out), structural changes and recent national politics, e.g. tuition fees for international degree students and recent cut-downs at Finnish and Danish universities. The selection of a specific university within each country was based on whether 1) the university had a strategy document containing internationalisation, 2) the strategy covering both management, academic and educational elements and response to the questionnaire (see Appendix IV) and 3) had a relatively long history and presence on ranking (Appendix II). Persons with high responsibility for internationalisation activities at the five selected universities were contacted and one respondent from each of the universities agreed to be interviewed. The interview guide (Appendix VI) was developed on basis of the results from the discourse analyses and questionnaire to explore and provide further information about what determines the success of a strategy.

An e-mail with an overview of the interview questions was sent to the respondents approximately one week before the interview took place (Appendix VI). The interviews were conducted in April 2016 by telephone and all interviews were audio recorded by use of an iPhone. Each interview lasted approximately 25-30 minutes with the same questions in the

⁵ <http://www.nsd.uib.no/personvern/en/index.html>

same order to all five respondents. The interviews were transcribed, resulting in a total of 35 pages of written interviews. In the recording, no reference to name, position or any other personally identifiable background information was registered so that individuals could not be recognised in the data material. Sound files (MPEG-4/.m4a) and transcribed interviews are stored, but not attached as appendices to the thesis. Using this approach, it was concluded that the study is not subject to notification to Data Protection Official for Research (NSD). The guidelines of Turner (2010) were followed for constructing effective research questions, implementation of the interviews and data interpretation.

3.6 Validity and reliability

In qualitative research, validity has been defined as truthfulness or authenticity (Neuman 2014), and concerns the question whether the researcher really measures what was intended to measure (Frankfort-Nachmias et al. 2015). Reliability means dependability or consistency and refers to the extent to the error of measurements (Frankfort-Nachmias et al. 2015). By using a variety of methods or techniques it is possible to record observations more consistently, and with diverse measures, different facets of a subject can be illuminated (Neuman 2014). Reliability is easier to achieve than validity according to Neuman (2014), and when a study is reliable, other researchers can reproduce the study and get similar results. If successfully combining high reliability and high validity, a study should provide a measure, which is both precise (valid) and accurate (reliable), and thereby have a high predictive power. However, with the complexity in social science, evidence of validity is difficult, and because of the wide use of indirect measurements in social science, also measurements errors may be more significant here than when physical variables are measured (Frankfort-Nachmias et al. 2015).

Validity in this study: The preunderstanding that a certain group of universities are much more successful with their strategies for internationalisation has contributed much to the design and research questions of the study. The potential researcher bias associated to the preunderstanding was reduced by 1) use of a theoretical framework, 2) research questions were anchored in the scientific theory, and 3) included a broad set of factors, not only

obvious explanations like age, size and elite-status of the universities in the study (Appendix II). The empirical validity is supported by the use of multiple sources of data (written strategy documents, questionnaires, interviews), and the triangulation of data. Case studies generally have high internal validity but low external validity and low generality. The low external validity of the study is linked to the fact that it only represents technical universities, it has a limited geographical focus, and cannot be fully replicated, as strategies, organisational culture and staff change over time. Further, due to the organisational structure at many universities, the International office mainly deals with the educational perspective of internationalisation, whereas internationalisation of research is the responsibility of deans and pro-deans. When interviewing leaders of international offices/affairs, the research perspective on internationalisation might be underrepresented. The questions for the interviews are constructed to include the research perspective, but it might not be fully covered. Thus, in the discussion and conclusion, there is focus on the limits of transferability for the study.

Reliability: Accuracy is ensured by the high level of structuring in the interview process and the recording of interviews allowed for a more attentive interview situation, not needing to focus on taking notes at the same time. The transcription of interview made it possible to check for misunderstandings and use correct citations. It is expected that this contributes positively to the reliability of the study and reduces interpretation biases. There is a possible measurement error in the questionnaire data, where the universities, who did not respond, may have a divergent view on internationalisation strategies, especially since many of the strong elite-universities did not respond to the questionnaire. By following the same thematic division throughout the thesis, it has continuously been checked whether research questions, theories, design of analyses, results and discussion were consistent and unbiased.

3.7 Research-ethical aspects

The purpose of the study is not to show how each of the universities deal with internationalisation, but to analyse the range of strategic work with internationalisation and present some of the best examples available. The names of the universities have therefore been omitted in some figures in order to facilitate a more neutral view on the findings.

The three ethical principles for the relationship between the researcher and the respondent /informant are 1) the right of privacy, 2) informed consent and 3) confidentiality (Bradburn et al. 2004, Neuman 2014). These principles have been guiding for the process of obtaining data for this study. Respondents for both questionnaire and interviews have been informed in written about the purpose of the study and to eliminate uncertainty, an informational e-mail has been sent out to the respondents before the questionnaire respectively interview (Appendix V and VI). In the e-mail and in the beginning of the telephone conversation, it was stated that the telephone interviews would be recorded and transcribed, but with no reference to name, position or other personally identifiable background information. Transcriptions helped to correct reproduction of the interview and secured that citations were not taken out of context. The transcribed interviews are not attached as appendices to the thesis, but stored in separate documents. The study is not sponsored by any organisation.

4. Results

4.1 The strategy documents

All 27 universities in the study had a written strategy document (strategy/strategy plan/strategy map) available at their external websites in English. For one university (Linköping University), the strategy map (1-page graphic) was supplemented by a research- and innovation strategy (in Swedish only). Internationalisation is embedded in the overall strategy for the majority of the universities. Three universities had a separate strategy document on internationalisation available at their websites (BTH, LIU, LTH) (in Swedish). The majority of universities (24) did not have an action plan for internationalisation available at their websites, one university had a separate action plan for internationalisation available at their website (NTNU) and two universities had the available action plan for internationalisation embedded in the general action plan (DTU, SDU).

When the status for strategy documents on internationalisation was asked in the questionnaire, nine respondents answered that their institutions have internationalisation integrated in the overall strategy and action plan, four respondents answered that their institution had a separate strategy for internationalisation, and two⁶ said that their institution do not have a strategy for internationalisation. Five institutions have a separate action plan for internationalisation, three do not have an action plan, and six say that it is integrated into the overall action plan.

Table 3. Respondent's answers to the question of whether the institution had a strategy and action plan for internationalisation (n=15).

	Yes, separate	Yes, integrated	No	Do not know
Strategy for internationalisation	4	9	2	0
Action plan for internationalisation	5	6	3	1

Based on the collection of strategy documents and answers from respondents, it can be concluded that it is most common to have strategic aims and plans for internationalisation

⁶ The two respondents stating that their university does not have a strategy for internationalisation (separate or not), do have an overall strategy respectively a research strategy available at their external websites in which internationalisation is mentioned. These documents are the ones used for the discourse analyses.

incorporated in the overall institutional strategy documents and action plans and that only a few universities have separate strategies or action plans on internationalisation available at their external websites. The discrepancy in the number of action plans available at the websites and what the respondents report may be due to some action plans being internal working documents.

All respondents but two (who answered 'do not know') in the questionnaire reply it is important to have a written strategy in order to be successful with internationalisation and they rated the usefulness of the strategy in terms of internationalisation a little over average (3.5) and also rated their institution successful above average with internationalisation (3.3). However, on average the respondents did not think that internationalisation is fully embedded in the organisation (2.9) (Figure 9). In the interviews, the respondents highlighted some important aspects of the strategy documents: The advantage of having a separate strategy for internationalisation was explained like this: *"Some think it is outdated to have a separate internationalisation strategy, it should rather be embedded in the general strategy for the university because it is such a big factor. But I think, both for the everyday work and the long-term goals, it is very useful to have a written strategy"* (HI). With internationalisation embedded in the overall strategy, the risk of internationalisation disappearing from the strategy is a concern: *"I think I would have preferred actually that the internationalisation would have been a more clear part of the new strategy as well [...] I am concerned that when it is not stated, it is not obvious to people who are not involved in international relations"* (Aalto).

The advantage of having a separate action plan in addition to the strategy document was stressed: *"We have a written strategy for the whole university and a written action plan for internationalisation. It means that we can 'force' the faculties and departments to follow up what the leadership of the university means. So an action plan is transferred to the level of the institution where the action is actually happening"* (NTNU). This approach was confirmed by other interviewees: *"We have a programme for internationalisation and we are currently in the process of making an action plan"* (UU).

Furthermore, the importance of changing type of strategy as the institution changes was highlighted: *"When we were a brand new university [...] it was very important to have a separate section on internationalisation. Now, in the new strategy internationalisation is*

embedded into all of our activities. So at different stages of the organisational development, the importance of a strategy plays a different role” (Aalto).

4.2 What does the articulated strategy tell us?

The discourse analysis showed that the word ‘international’ and its inflections occurs in all strategies (n=374), and represents an average of 0.8% of all words, varying from 0.3% (KTH) to 2.2% (Oulu) (Figure 6). In addition, 24 of 27 universities use the words ‘global’ and/or ‘eu/europe’ and their inflections in their strategies, but generally to a much lower degree than ‘international’. The collective of ‘international’, ‘europe/eu’ and ‘global’ is on average 1% of all words, varying from 0.3% (ÅAU) to 2.5% (RU) (Figure 6). There appear to be no special trend towards patterns of country, size, age or ranking related to the frequency of ‘internationalisation’, ‘global’ or ‘eu/europe’ in the strategies.

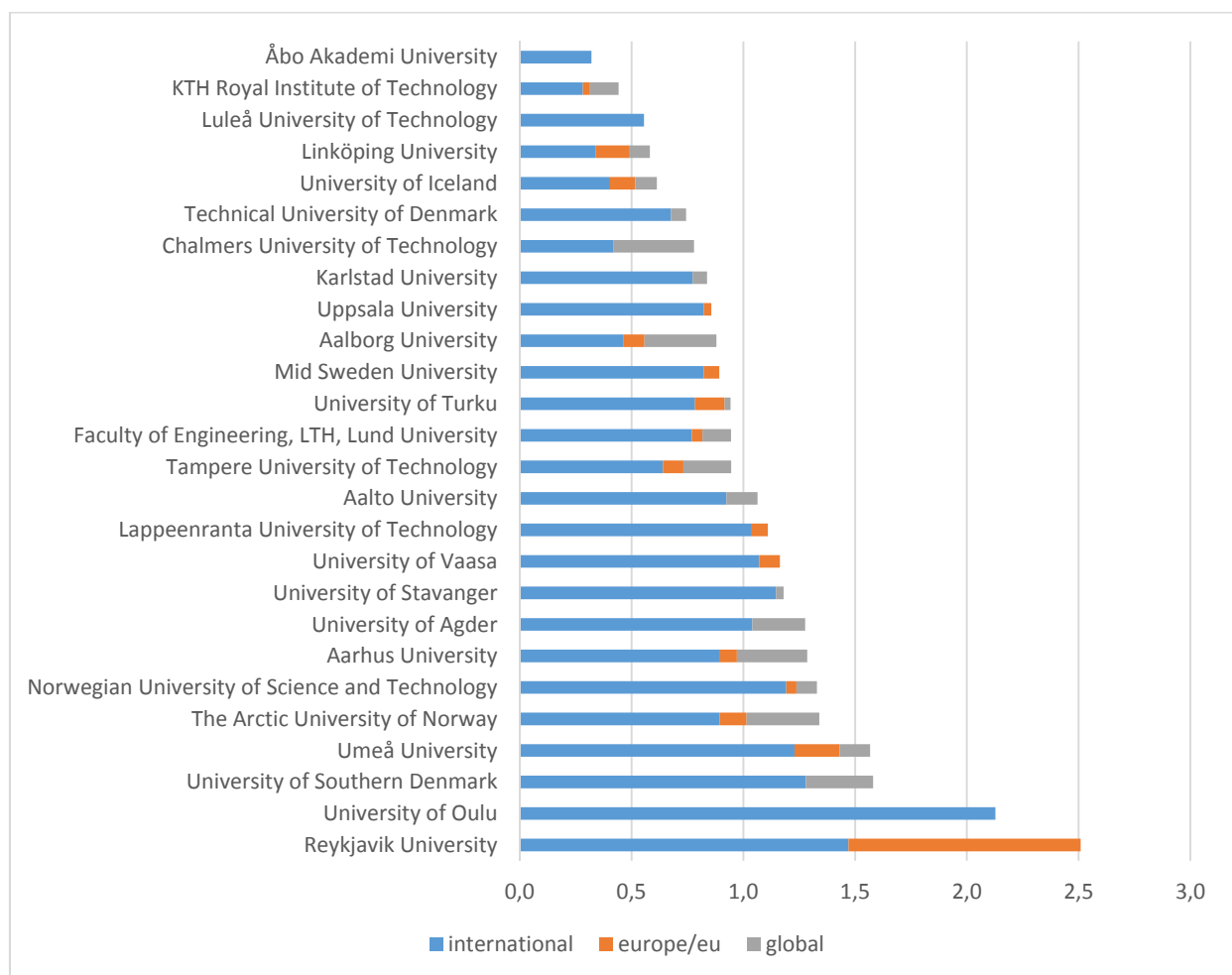


Figure 6. The relative frequency of the words ‘international’, ‘europe’/’eu’ and ‘global’ in relation to the total number of words in the strategies of the 27 universities in the study.

When analysing the 374 words immediately coupled to ‘international’⁷ in the strategy documents, 141 different words were found. The ten most frequent words are listed in Table 4, with the full list available in Appendix III. Table 4 shows that ‘research’ is by far the most common term coupled with ‘international’, followed by ‘student’. Further, ‘competition’ is more common than ‘cooperation’, and the remaining words in the table indicate that internationalisation is rather important for quality, recruitment, reputation and alliances at the universities. Thus, it appears that the strategies for internationalisation mainly focus on the two main activities (‘research’, ‘education’) followed by external relationships (‘competition’, ‘collaboration’), comparative aspects (‘level’, ‘quality’, ‘recognised’) and interactions (‘network’, ‘partner/partnerships’, ‘recruitment’).

Table 4. Absolute and relative numbers for the ten most common words coupled with ‘international’ in the strategy documents for 27 Nordic technical universities. A total of 374 words (141 unique words) were directly coupled with internationalisation.

Word	Number	Frequency (%)
research	21	5,6
student	14	3,7
competition	12	3,2
collaboration	10	2,7
level	10	2,7
quality	10	2,7
network	9	2,4
partner/partnerships	9	2,4
recognised	9	2,4
recruit/recruitment	9	2,4

A thorough check of all the strategies for statements which describe the reasoning and aims for internationalisation of research, education and management respectively show that focus is much more on internationalisation of academia (research and education) than internationalisation of the managerial and administrative side of the institutions (Appendix IV). All 27 strategies had one or more statement relating to the internationalisation of research, 26 out of 27 strategies had one or more statements relating to the internationalisation of education, and 11 out of 27 strategies had one or more statements

⁷ E.g. ‘ambition’ in the paragraph ‘Our university has international ambitions’.

relating to the internationalisation of management and administration. The 11 strategies, which contained considerations about internationalisation of management all had focus on both research and education as well. These 'triple'-strategies have broad geographical distribution (Denmark, Finland, Norway and Sweden), represent both 'old' and 'young' universities, and national and regional scope. However, they are almost all (10 out of 11) on the ranking lists (Times Higher Education 2016), which is higher than the cohort on average (18 out of 27).

In text, some institutions put the statement on internationalisation short and concisely: *"Our development is dependent on how well our research, education and administration is internationalised"* (LTH), while other institutions focused specifically on each dimension of internationalisation.

Research: *Within their respective primary disciplines and fields of interest, DTU's departments will be able to develop and maintain internationally leading research environments* (DTU).

Education: *The aim of the University is that all degrees include a section that prepares the student for internationalisation, which will be defined in more detail by the faculty granting the degree. In addition to student exchange or international practical training, this may mean, for example, language teaching, intercultural communication skills, teaching in foreign languages and utilising foreign experts in teaching, for instance, with the help of data and communication technology* (University of Turku).

Management: *An internationally outstanding university depends on the active involvement of students and staff. This requires inclusive leadership and effective collaboration with the student democracy and the employees' organisations.* (NTNU).

The competitive and cooperative focus is also reflected in the interviews, where the respondents describe the priorities of the strategic work on internationalisation.

Competitive: *For the university in general the priorities are: How do we continue to be a world leading research institution? How do we continue to deliver first class education? How do we achieve excellence and purpose for the surrounding society?* (UU).

Collaborative: *We are very active in collaboration in research and it is important because we are a small nation. International research cooperation is vital to us (HI).*

Summing up, internationalisation plays a visible role in all strategies with a prioritised focus on research, shortly followed by education, but less on management, and only 1/3 of the strategies focused on all three aspects. The strategies associate internationalisation with both competition and cooperation, but competition more frequently.

4.3 The institutional rationale for internationalisation

The text analysis of the strategy documents show that 'Rationale', 'Outcomes' and 'Activity' are the three most common institutional motives for internationalisation, when analysing the frequency of words and statements associated with internationalisation (Figure 7).

The assignment of words linked to internationalisation to the six motives for internationalisation (Appendix III) show that the most common motives for internationalisation across all 27 universities in the study are 'Rationale' and 'Outcomes', followed by 'Activity' (Figure 7, Table 5). The 'Rationales' perspective is focused on the motivation and rationales driving internationalisation. Typical words are level, elite, profile, recognised, competitive, position, impact, quality. The 'Outcome' perspective focuses on the desired results of internationalisation and typical words associated with this strategy are partners, network, research, students, community, and research. The third main group is the 'Activity' perspective, where the strategy focuses on activities associated with internationalisation. Typical words associated with this strategy are education, teaching, exchange, mobility, cooperation, collaboration. For the remaining three types of motivation, there is little indication of the use of these by the universities in this case. For 'Process' motivation, only one university (RU) had a substantial number of words related to it. For the 'Ethos' perspective, six universities (SDU, AAU, AU, Aalto, TUT, ÅAU) had a few words associated to it. For the 'Abroad/cross border' perspective, only one university had one word associated to it (Aalto).

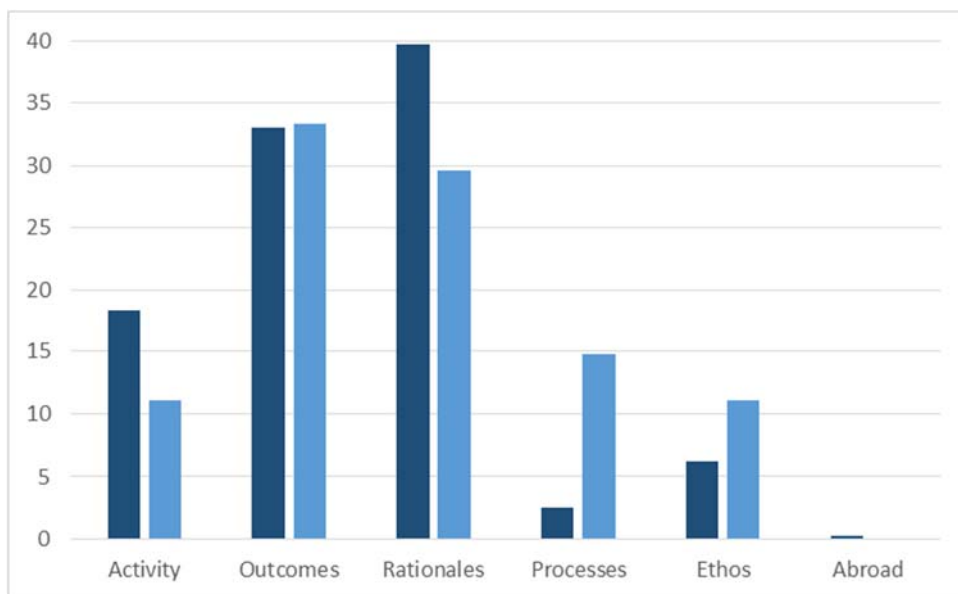


Figure 7. The distribution of words and statements directly coupled with ‘international’ to the six rationales for internationalisation according to Knight (2008). Dark blue = words, light blue = statements.

Table 5. Frequency (%) of words and sentences related to the six rationales for internationalisation according to Knight (2008)

	Activity	Outcomes	Rationales	Process	Ethos	Abroad
Words	18,3	33,0	39,7	2,5	6,2	0,3
Statements	33,3	29,6	14,8	11,1	11,1	-

The assignment of statements describing the motive(s) for internationalisation for each strategy document showed that the dominant motives are ‘Outcomes’ and ‘Rationale’ followed by ‘Processes’, ‘Activity’ and ‘Ethos’ (Appendix IV, Table 5). No statements were assigned to ‘Abroad’. The distribution of statements was rather similar to the allocation of words and there was good internal compliance between the allocation of words and key sentences for the majority of strategies, meaning that a university strategy depicted as predominantly ‘Outcomes’ oriented by words also is ‘Outcomes’ oriented by key sentence (Figure 7).

In the ‘Activity’ motivation, internationalisation is described in terms of activities like study abroad, curriculum, academic programs, international students, institutional linkages and networks, development projects, and branch campuses. Examples of key sentences from the strategies are: *“The university has a large number of international students and staff, and we will extend our already high level of internationalisation by aiming to increase the number of*

students and staff spending time abroad and by attracting more students and researchers from other countries.” SDU, Denmark and “Internationalisation reflects the fact that research basically is independent of national borders. In the upcoming period, Mid Sweden University should emphasise the strengthening of the integration of our research in the international research community” (MIUN).

The ‘Outcomes’ motivation focuses on desired results such as student competencies, increased profile, and more international agreements, partners, or projects. Examples of key sentences from the strategies are: *“The University’s international reputation is built on the visibility of its research. Success in research leads to international networking, which in turn improves the University’s competitiveness and the quality of its operation” (UTU). “As an international research university, the University makes an important contribution to the academic community, prepares its students to participate in the international community and provides them with training to meet the challenges of the 21st century” (HI) and “Through internationally acclaimed education and research combined with a professional innovation process, Chalmers’ mission is to become one of the world’s most attractive universities” (Chalmers).*

The ‘Rational’ motivation describes internationalisation with respect to the primary motivations or rationales driving it and includes e.g. academic standards, income generation, cultural diversity, and student and/or staff development. Examples of key sentences from the strategies are: *“The university’s participation in the competition for the finest talents among both students and researchers must be intensified, and the international circulation of talent must be strengthened. The university must lead the way in establishing unique, modern research infrastructures that will provide the best possible frameworks for research and will attract top researchers from among the international research community”. AU, Denmark, “Our goal for the University’s entire operations is to achieve high international quality and recognition” (Aalto). “NTNU aims to become an outstanding university by international standards. This requires us to have world-class academic environments ourselves, and to seek collaboration with other leading knowledge communities in the world” (NTNU) and “KTH operates in an international market, and must be able to compete with other excellent technical universities for the best researchers and students” (KTH).*

The 'Process' motivation focuses on internationalisation as a process in which an international dimension is integrated in a sustainable way into the three primary functions of an institution: teaching/learning, research, and service to society. Examples of key sentences from the strategies are: *"The pace of change in society is rapid. Globalisation is the most important external factor influencing LTH and our development is dependent on how well our research, education and administration is internationalised"* (LTH) and *"Uppsala University is a local, national and international meeting place for knowledge, culture and critical dialogue. By actively working to increase our international orientation, we are in turn benefiting in Sweden in the long term"* (UU).

The 'Ethos' motivation interprets internationalisation as the creation of a culture or climate on campus that promotes and supports international/intercultural understanding and focuses on campus-based or "at home" activities. Examples of key sentences from the strategies are: *"Tampere University of Technology is Finland's premier and most international technology-oriented community of students and scholars that is dedicated to promoting the well-being of humanity and sustainable development"* (TUT) and *"The task of Åbo Akademi University is to provide an open, Swedish-speaking university environment for quality research and studies with a Nordic and international anchorage"* (ÅAU).

No key sentences were found to be representative for the 'Abroad' motivation, where internationalisation is seen as the cross border delivery of education to other countries and through different administrative arrangements. The information on motivation from the respondents, both questionnaire and interviews, show a more regular distribution across the six motives (Figure 8, Table 6).

Compared to the institutional rationales as described in the strategies (Figure 7, Table 5), the respondents in both questionnaire and interviews give high importance to 'Activity', but also higher emphasis on the 'Process', 'Ethos' and 'Abroad' motives. Also, the respondents place less importance to the 'Outcomes' and 'Rationales' rationales than the strategy documents do. Thus, the focus on outcomes and rationales from the written strategy documents is replaced by a stronger focus on both activity as well as processes and ethos when employees working with internationalisation respond in questionnaire and interviews. There is a shift from the formal motivation written documents to the everyday experience from working with the implementation of internationalisation. Can it be an indication that

internationalisation is moving from ‘old’ to ‘new’ forms, which is not reflected in the strategy documents (updated only periodically), but expressed more freely and up-to-date when people are asked? It should also be noted that the ‘Activity’ rationale may be overrepresented in the questionnaire and interviews, as this was the first rationale on the list, and therefore the intuitively most important rationale. The six rationales were not randomised on the list. However, activities are often strongly associated with internationalisation, and therefore something many will focus on.

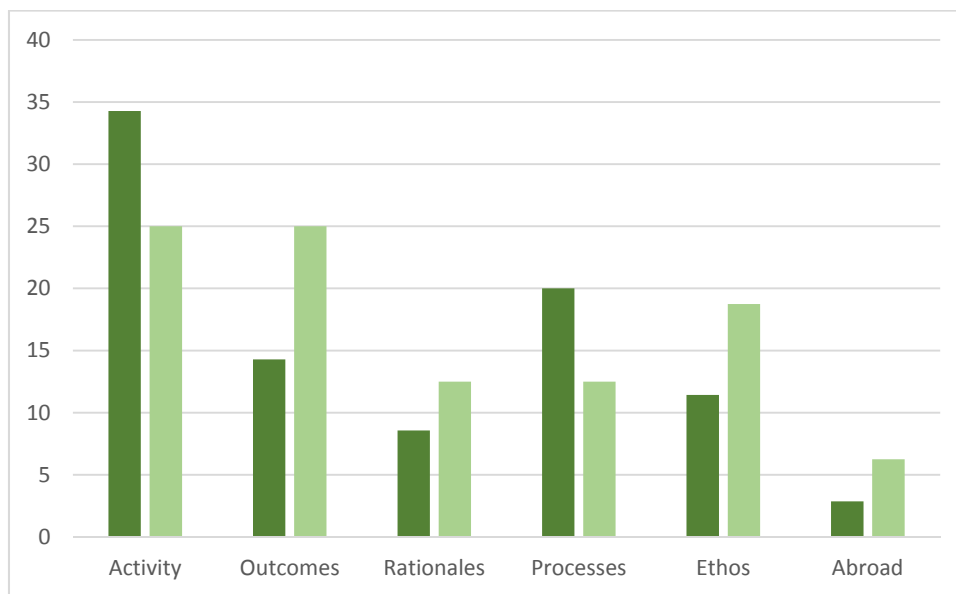


Figure 8. The distribution of motivations for internationalisation by respondents as to the six rationales for internationalisation according to Knight (2008). Dark green = questionnaire, light green = interviews. Respondents (n=12 for questionnaire, n=5 for interviews) were allowed to select more than one answer, and in total 32 respectively 16 answers were given.

Table 6. Frequency (%) of words and sentences related to the six rationales for internationalisation according to Knight (2008).

	Activity	Outcomes	Rationales	Process	Ethos	Abroad
Questionnaire	34,3	14,3	8,6	20,0	11,4	2,9
Interviews	25,0	25,0	12,5	12,5	18,8	6,25

The interviews provided further details about the motives for internationalisation. Especially quality was a recurring theme, for example at Uppsala University: *“When we speak of internationalisation at our university, the main driver is quality. The focus is on quality in both research and education”*, Aalto: *“I wouldn’t say necessarily more international agreements and partners, but better international partners and agreements”* and NTNU:

“One of the main threads in our action plan is that we are going to pick some strategic important institutions to work with. It doesn’t mean that we cut out the others, but we are going to focus on some of them, so that we do not focus on 500 agreements. We have a certain number, that we feel are more important than others. So strategic partnerships and agreements are very important to us”. Also, that internationalisation is simply part of the university profile was mentioned: *“We feel that internationalisation is more or less part of our DNA. I mean, you can see international students, you see international teachers, and you speak English. I don’t know how aware of it we are, it’s just kind of living among us”* (AAU).

4.4 Leaders, faculty, or students - who are most important for implementation of the strategy?

In the questionnaire the majority stated that rector or vice-rector is overall responsible for internationalisation at the institution. For implementation of the strategy, the respondents of the questionnaire (n=13) point to rector as the most important person (Table 5). In addition to rector, the respondents of the questionnaire pointed to academic staff, vice-rectors, deans and administrative staff as important persons or functions for implementing the strategy for internationalisation.

Data from the questionnaire shows that the motivation among students has the lowest rate of all four groups (3.1) (Table 6). Thus, there appear to be a challenge with the motivation of students for internationalisation. The motivation among administrative (3.5) and academic staff (3.5) was above average (Table 6) and for academic staff, no respondents rated below ‘3’. Leaders were on average scored less motivated than the academic and administrative staff (3.4), but apparently leaders are either rated to be above average or below average in motivation for internationalisation (Figure 9).

When asked to score the importance respectively motivation of the support from the four main groups (leadership, administration, academics, and students), a discrepancy between importance and motivation appears. The importance of leadership support is scored very high (4.9 out of 5). For all four groups, importance is scored higher than perceived motivation, indicating that the expectations are higher than the performance. The discrepancy is largest for leadership support and smallest for administrative support (Table 6).

Table 5. Respondent's answers (%) to who are the most important persons or functions for the institutional implementation of the strategy for internationalisation. Respondents (n=13) were allowed to select more than one answer, and in total 47 answers were given.

Top leadership				Administrative			Academic	Students	
Rector	Vice-rector	Dean	Vice-dean	Head of international office	Staff at international office	Admin staff	Academic staff	Students	Student organisations
17	11	11	2	13	11	13	15	6	2

Table 6. Scores of the motivation and importance of leadership-, administrative-, academic-, and student support to implementation of the strategy for internationalisation. Scale 1 to 5, where 3 is average.

	Leadership support	Administrative support	Academic support	Student support
How motivated are they? Questionnaire (n=13)	3.4	3.5	3.5	3.1
How important is their support? Interviews (n=5)	4.9	3.6	4.6	4.2

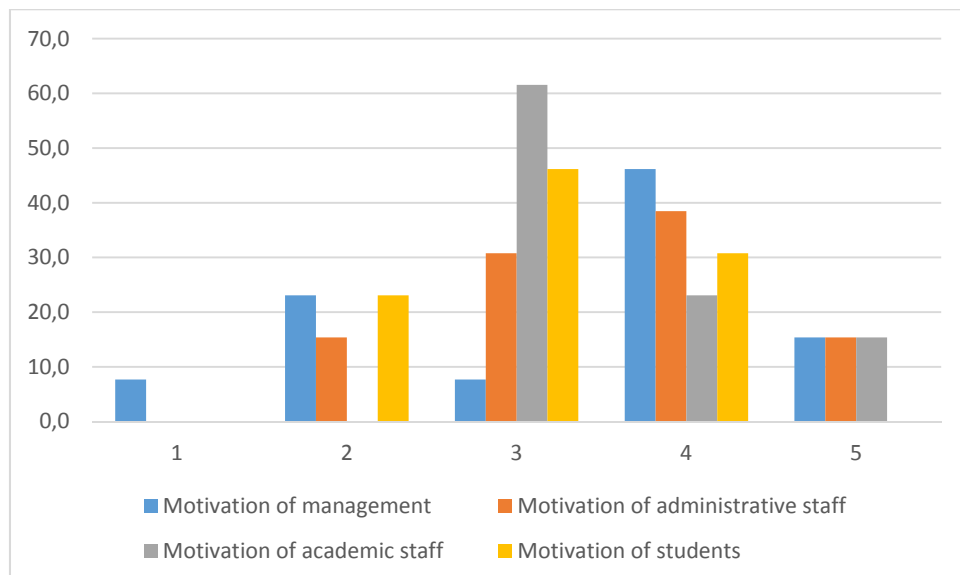


Figure 9. Scores for the motivation for internationalisation at the universities in the questionnaire. Respondents (n=13) scored the actual motivation of the four groups (management, administrative staff, academic staff, students) on a scale from 1 to 5. Average values for each group are provided in Table 6.

The high score for leadership (4.9) by the interviewees was supported by statements about the importance of leadership support for communicating and implementing strategies for internationalisation:

“With organisational support in place, it is the leadership. Both the leadership of the unit, but more so the leadership of the university and that the rector and highest administrative level, that all the directors know about the importance of internationalisation (HI).

“To have a rector or pro-rector, who says that our university is interested in internationalisation, and say “We believe we should focus on this and this”. [...] That would be a big help” (AAU).

“I think it is extremely important that the leadership of the organisation, the rector actually goes out and says what it needs: “This is important and you have to do this”, not only once, but you have to repeat it. [...] It goes like this: If the rector is clear, then the dean would be clear, and the head of department would be clear. But if the rector is not clear, neither would the others be. So it is a Catch-22. I think it is very important that the leadership follows up” (NTNU).

For the students, the gap between motivation and expectation (Table 6) may be partially explained by the student’s attitude to internationalisation at home and partially to the student organisations: *“We do have some study programmes where it is a bit of a problem. The Danish students they just would like to continue in the groups they’re in already and they find it a bit hard to involve an international student in the work” (AAU).*

For academic staff, the gap between motivation and expectation (Table 6) may be linked to individuals, who are uninterested or working against internationalisation: *“Sometimes you would meet a very powerful dean or professor or someone like that, who for some reason would work against a strategy like that” (AAU) and “There are always some people who think it is not a good idea or too much of a burden or too destructive or whatever” (HI).* However, the active recruitment of international academic staff may contribute to other aspects of internationalisation: *“The number of international professors has increased substantially. Now we have 30% of our professors coming from outside Finland. They have diversified the university and at the same time, that has of course influenced the way we work at the service organisation” (Aalto).*

4.5 Barriers and key components of successful internationalisation

Both external and internal barriers for successful internationalisation were found in this study. National policies for higher education and research is reported a guidance but also an external barrier for successful internationalisation by the interviewees. A national strategy can be of good help, provided it allows for institutional adaptation:

“I think it is a little bit tricky: If the strategy is broad enough and specific enough at the same time, although a challenging combination, it can help the institutions to extend and direct their activities” (Aalto).

A national policy can be an obstruction, or something that changes the direction of internationalisation, both at the overall level and for specific elements like e.g. recruitment of international non-EU students (Denmark and Sweden) and changes in funding schemes:

“What happens at the governmental/national level has a huge impact on the work we do in different areas. In 2011 fees for non-European students were introduced. If the government would take it away it would change the landscape completely” (UU).

“It has a large impact, especially if you have a government, which is very much focused on internationalisation [...] it inspired the university as a whole to do a lot of different things. Whereas now, with another kind of government, where the focus is not on internationalisation, it is sleeping a little bit at the university as well. You can also see it in the strategy. We have a new strategy, but internationalisation is not part of it. I think it has to do with how the national government is looking at internationalisation at the moment” (AAU).

With global and national policies for internationalisation changing more often or out of sync with the strategies of the universities, some institutions have chosen to no longer mention specific geographic areas in their strategies:

“We actually want to increase collaboration within Europe, because of the money. Otherwise we have no geographical focus in the action plan. [...] the world around us is living and we just have to follow up on what is happening around us. So no, we have no focus on national strategies in the action plan” (NTNU).

Internally, the barriers for implementation are linked to 1) units or individuals, who are uninterested in internationalisation or even working against it, as described in section 4.4

and 2) finance and time. The interviewees primarily point to internal financing of initiatives and activities. None of the interviewees mentioned lack of external funding as a barrier:

“The barrier is finance. People complain it is expensive to make an international curriculum, to teach in English. To have international students is time consuming. People complain about this” (HI).

“Of course there needs to be a vision, people willing and believing in internationalisation but they can only do so much without money” (UU).

The organisational set-up at the universities is important for successful internationalisation. All respondents in the questionnaire (n=15) answered that their institutions has a unit, where international activities are coordinated and the interviewees highlighted that institutional support as an important factor for a successful strategy for internationalisation. The interviewees all describe the function of the international unit, centralised or embedded in the organisation, as the wheel hub, which communicated out in the organisation and executes many of the tasks described on strategy documents and action plans.

A key component of internationalisation is to have a broad spectre of activities (Figure 10). They are tools in the strategy implementation at the institutions. In this study, activities related to student and staff mobility and coordination of networks and agreements are most common. Interestingly, the task of giving advice to the management is a rather small part of the activities, which is in contrast to the respondents input that top-management is the most important group of persons for implementation of the strategy (Table 5).

Partnerships are an important outcome (Figure 11). The other important group of outcomes is related to internationalisation at home with e.g. diverse student community, attracting internationally outstanding researchers and students. This all contributes to the building of diverse faculties and may contribute to an increase in external funding. One of the interviewees formulate it like this: *“I think we should be better in recruiting and marketing. If we are thinking the same kind of way [across the organisation] we would be more successful”* (AAU).

The information from the questionnaire show that there are two distinct groups; one group having an explicit talent focus by attracting both internationally outstanding researchers and

top-level students and the other group having a diversity focus by building a diverse faculty and a diverse student community.

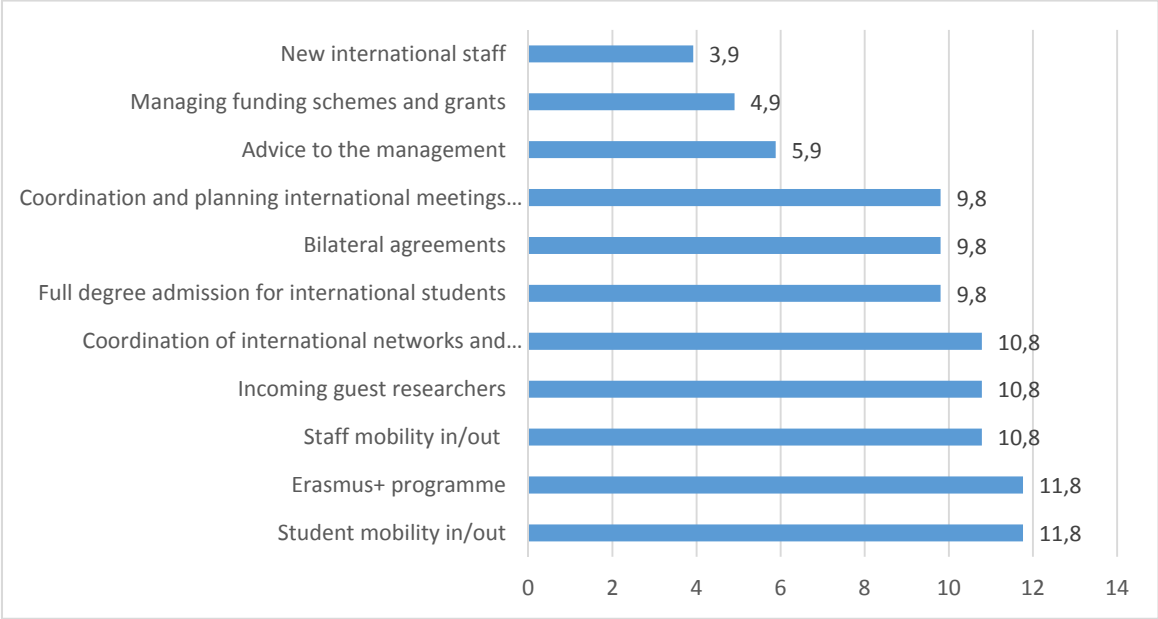


Figure 10. Distribution (%) of activities, which respondents (n=12) regard main parts of internationalisation at the institutions. It was allowed to select more than one answer, and in total 102 answers were given.

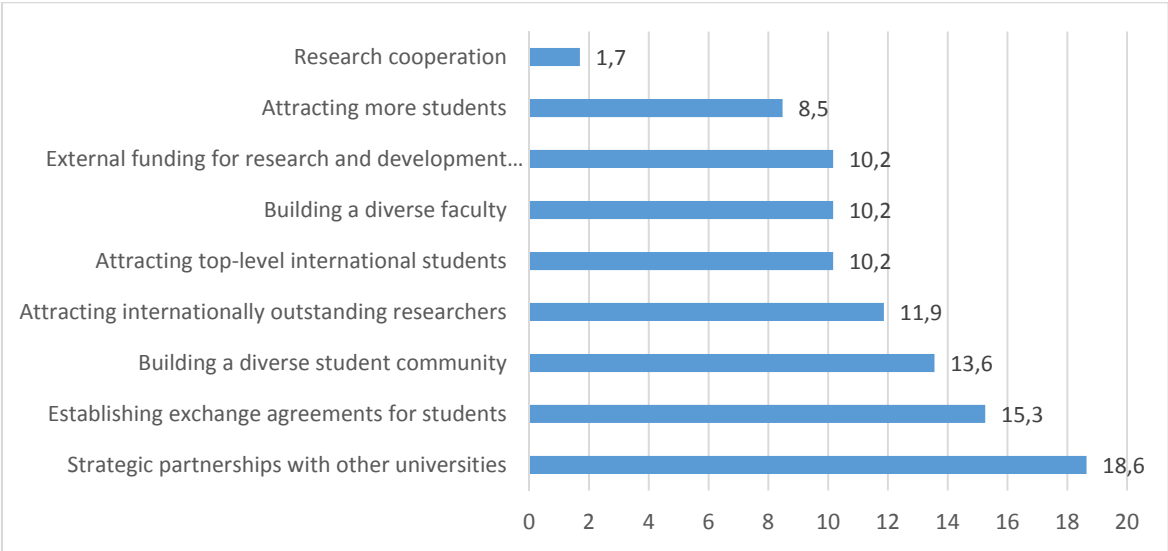


Figure 11. Distribution of the most important outcomes of internationalisation. Respondents (n=13) were allowed to select more than one answer, and in total 59 answers were given.

The respondents in the interview stressed the importance of time and being in dialogue with the whole organisation, in order to implement a new strategy:

“We are still in the period where we are making the change and mainstreaming internationalisation. We will need a couple more years before the whole organisation understands what it means for internationalisation to be part of everything in our strategy, and also that implementation is a task of nearly everyone” (Aalto).

“We need to make it practical and concrete and showcase good ideas and handling of things in order to be real.... So far, it has been the approach of going output to meet and be able to talk about different priorities for different representatives within the organisation to create some kind of ownership for the internationalisation project as such” (UU).

“We will be working with colleagues across the organisation to try to have the strategy embedded in the organisation” (AAU).

“It has a lot to do with visibility. A lot to do with discussing with the leaders and student leaders about the importance of internationalisation, seeing it as a central part of internationalisation” (HI).

Last, but not least, the importance of having an action plan is highlighted by several of the respondents in the interviews:

“The main thing is actually the goal of going from a strategy an action plan. The action plan is so much more hands on” (NTNU).

“If you have a clear strategy and clear goals and action plan, that is the only way to go” (HI).

“Being a huge university with such a broad range of areas, we are now considering having an action plan on a central level incorporating the vice chancellor’s initiatives held together by the central administration” (UU).

In summary, the key components are nicely reflected in the description by the respondent at Uppsala University: *“The key success is to make it alive, it sounds fluffy, but key is to have people meet and try to be very concrete about what it is that you want, what the hinders/ barriers are, what you feel needs to be changed in order to achieve this and that. If you create that kind of opportunities for open talks, I think you have come a long way in implementing a thinking of internationalisation in the organisation” (UU).*

5. Discussion

5.1 The strategy documents

The strategy documents for internationalisation at the universities in this study gives the impression that Nordic technical universities in general have a strategic and integrated approach to internationalisation. All institutions had strategy documents externally available in English and internationalisation was typically embedded in the overall strategy, and only a few institutions had a separate strategy for internationalisation. The Nordic integrative approach is also documented in other recent studies (Frølich et al. 2014) but is in contrast to universities worldwide. This is in contrast to global findings by the International Association of Universities, which show that most universities globally have a separate policy or strategy for internationalisation and that only 16% of the universities have internationalisation form part of the overall institutional strategy (Egroun-Polak and Hudson 2014).

For action plans, the majority of universities in this study did not have action plans for internationalisation externally available, but in some cases actions for internationalisation were incorporated in the overall action plan. However, both staff at international offices (questionnaire) and leaders with responsibility for internationalisation (interviews) stressed the importance of having not only a written strategy in order to be successful with internationalisation, but also to have clear and visible actions or an action plan in addition to the strategy document. The argument being that without an action plan it is difficult to implement the strategic aims. Also the importance of being able to change the strategy for internationalisation as the institution changes was highlighted, with university mergers and large organisational changes as examples, where not only the strategies but also the organisational structures and modes of support for internationalisation is changed fundamentally.

5.2 What does the articulated strategy tell us?

The strategy documents in themselves largely live up to the definition of strategy as the long-term direction of an organisation (Johnson et al. 2014), and examples of both competitive and cooperative elements are found in most strategies. It is characteristic that internationalisation plays a visible, but variable role in the overall strategies of the

universities, but is not a goal in itself. Rather, internationalisation is used as an adjective to the many aims and activities at the universities. In the strategy documents and by staff at international offices, internationalisation is described as an instrument for higher quality, strategic networks and partnerships, talent hunt, external reputation and funding. Also the leaders of international units describe internationalisation and activities associated with it as a tool for obtaining better quality in research and educational activities. Thereby, the strategies seem to incorporate measures to deal with the global trends of competition at the educational market, changes in student and youth culture, digital technology, and integration of research and education with industry and society (British Council 2013, Kekäli 2013, Calderon 2015). These trends illustrate that mobility activities, strategic partnerships and competition for the best students and academic staff may increase in the future, and that price, branding and reputation will influence the attractiveness of a university as destination for studies or research.

The strategies have a wide span with regard to length, look and content, and can be seen as external branding of the universities and their scope and quality. However, the stories told in the strategy documents are for almost all universities equally focused on international competition and international collaboration. Another general feature is that a word like 'ranking' is almost absent from the strategy documents. This may be linked with the Nordic culture of equality, but the fact that 'competition' is as common as 'collaboration' may indicate that competitive aspects are growing in importance. The collaborative aspect can also be found in strategies for internationalisation in other North-European countries, e.g. Germany, where internationalisation strategies are characterised by their use of cooperation and aims to foster participation in international collaborations, strategic alliances, and networks (Graf 2009). This may be partly explained by the active commitment to the European dimension of internationalisation caused by the Bologna process.

Research and education are the two main activities linked to internationalisation, but also external relationships, comparative aspects and interactions with other universities are important. The high focus on education may be a reflection of national priorities for student mobility, where e.g. Finland, Norway and Sweden share a target of at least 20% of graduating students should have been on a study or training period abroad (Centre for International Mobility (Centre for International Mobility (CIMO) et al. 2013). In Norway, the

minister of education has recently proposed that all students should have a study period abroad (Larsen 2015). The importance of research in internationalisation is probably linked to long-standing academic relationships between scholars, often based on joint research projects and researchers with previous positions at other universities.

The high focus on internationalisation of academia in the strategy documents is in contrast to the very limited focus on internationalisation of the managerial and administrative side of the institutions, with a little over 1/3 of the strategies having triple focus on research, education and administration. Interestingly, these 'triple strategies' were not linked to one country or one type of universities, but these universities were much more frequent (10 out of 11) at ranking lists like Times Higher Education (2016). This may be that there is a link between overall high-performance and a well anchored institutional approach to internationalisation. Thus, for the remaining two thirds of the universities in the study, there may be room for making the strategies for internationalisation cover all organisational aspects of the institutions for future performance.

5.3 The institutional rationale for internationalisation

While the written strategy documents tell that the institutions have their motivation for internationalisation within the rationales 'Rationale', 'Outcomes' and 'Activity', as defined by Knight (2008), the respondents in both questionnaire and interviews have a different perspective on the motivation. They also give high importance to 'Activity', but higher emphasis on 'Process', 'Ethos' and 'Abroad' as rationale, and less importance to the 'Outcomes' and 'Rationales' rationales. The apparent gap between the formal motivation in the written documents and the everyday experience of institutional motivation from those working with the implementation of internationalisation is a gap between ideals and reality. It can be an indication that internationalisation is moving from an 'old' to a 'new' form, and that the strategy documents are yet to be updated to a new mode of internationalisation. It is also possible that the motivation is more freely described and reflects the hand-on work with implementing the strategic aims in the organisation, when people are asked.

Especially the increased focus on 'Process', where the international dimension is integrated into the three main pillars of the universities, education, research and services to society and

'Ethos', where internationalisation is about creating a culture at campus to promote international and intercultural understanding, often referred to as 'internationalisation at home', can be seen as a sign of the new form of internationalisation. This was for example described as internationalisation being part of the 'DNA' of an institution.

As shown by key statements from the written strategies, the high focus on 'Outcomes' in the strategy documents is probably linked to the function of such documents for external communication, showing what ambitions of excellency, partnerships and alliances, and performance an institution has. This can be difficult to associate to as an employee or stakeholder in the organisation, unless explicit targets are described in an action plan.

Finally, it is possible that the 'Activity' rationale is overrepresented in the questionnaire and interviews, as this was the first rationale on the list, and therefore intuitively seen as an important rationale (the six rationales were not randomised on the list). However, activities are often strongly associated with internationalisation, and therefore something many will focus on naturally, although it is only a narrow part (Frølich et al. 2014) of strategic internationalisation.

The interviews showed a very high focus on quality, and that the universities strategically and actively use internationalisation to increase quality of both research and education. This was for example reflected in descriptions of how leading universities direct their focus on mobility agreements to strategic partner institutions, but also in the description of how institutions work with recruitment of good international students.

A recent study of the institutional motivation for internationalisation at all Swedish higher education institutions (Ahlstrand 2015) show that for the Erasmus+ programme, the main rationales are 1) understanding of other cultures, 2) managing globalisation, 3) quality and excellence in education, 4) employability, 5) recruitment (attracting students and teachers), 6) diversity, 7) quality and excellence in research, and 8) international recognition. Although this study only focused on internationalisation in a European perspective, there are many parallels to the results here, for example the double focus on collaboration and competition, the strong focus on quality in both research and education, and that aspects of both 'Process' and 'Ethos' are present in the motivation.

A full study of strategies for internationalisation at Norwegian higher education institutions (Pettersen 2013) shows three main rationales for internationalisation: 1) quality, 2) societal contributions and 3) resources. Here, quality includes rationales like reputation, research, recruitment and employability. Pettersen (2013) found that solidarity and cultural understanding, two classical approaches to internationalisation of education and research, are almost absent from the strategy documents, and refers to international trends of economic rationales becoming more dominant.

A common finding of the studies by Pettersen (2013) and Ahlstrand (2015) is that the institutions rarely clarifies the way in which internationalisation contributes to the quality. Although it is difficult to concretise the relationship between internationalisation and quality, it would contribute significantly to the applicability of the strategy internally and the communication of the institutions ambitions and goals for internationalisation, both internally and externally. In this study, strategic partnerships and recruitment of good students were explicitly mentioned as key components of higher quality in research and education, but most likely there are many other components of internationalisation, which are not stated explicitly as quality instruments. It is anticipated that a more clear description of how internationalisation leads to higher quality would improve the understanding and accept of internationalisation as a strategic tool for quality enhancement of the institutions.

5.4 Leaders, faculty, or students - who are most important for implementation of the strategy?

Strategy in action (Johnson et al. 2014) is about how strategies are formed and implemented, with emphasis on the practicalities of management. This is one of the three elements in the strategy model applied in this study, and is directly coupled with the importance of leaders, faculty and students for implementation of a strategy.

The importance of leadership support for internationalisation is scored very high by administrative staff in the questionnaire, and the interviews with leaders of international units regard a clear and visible leadership with strong focus on communication internally as well as externally highly important for successful strategy implementation. The importance was scored much higher than the actual motivation of the leadership. Not all universities in the study did have such a leader; those who had, underlined the effect throughout and

downwards in the organisation; those who hadn't explained why they would want one. The theory on the path from intended policy to implemented practice (Marchington and Wilkinson 2012) underlines the path-dependency of strategic management and it also seems to be in accordance with the latest global survey of internationalisation (Egrom-Polac and Hudson 2014), which shows that internationalisation mainly is driven by the most senior levels of leadership of the institutions. In a study of strategy implementation, Heide et al. (2002) found that many of the staff had no idea how the strategic initiatives would affect them, and some of the initiatives they had not even heard of. This might be a quite general finding, and transferred to a university perspective, the management should be aware that the presence of major communication barriers in the organisation may hinder successful strategy implementation.

The relatively strong demand for clear leadership and top communication, as asked for by all respondents in the interviews, is somehow in contrast to the common understanding of leadership culture in the Nordic countries is based on consensus, where leaders have to manage a collegial style of decision making and take equality into the leadership model (Goldsmith and Larsen 2004 p. 131, Grennes 2012) and score low on power distance, as described by Hofstede (Smith et al. 2002). However, it could be linked to the observation that universities have generally become more hierarchical and centralised (Bleiklie 2014) or the fact that a more clear and authoritative leadership model is needed in periods with a high degree of changes, such as when implementing a new strategy.

In this study, students are reported to be involved in the internationalisation processes to a limited degree. There seems to be only minor differences between Finnish, Norwegian and Swedish students in their attitude towards outward mobility (Centre for International Mobility (CIMO) et al. 2013), so differences in national policies or institutional culture does not influence the interest in internationalisation very much. However, an interesting detail is connected to the male dominance of e.g. engineering programmes. With female students more often than male students planning and taking part in educational exchange abroad (Centre for International Mobility (CIMO) et al. 2013), the male students within technology and engineering programmes may be particularly difficult to involve in internationalisation activities, at home or abroad. Thus, the motivation of students may be more faceted, as both study discipline and gender plays a role.

For the actual implementation, the whole team of academic staff, administrative staff and students and student organisations are important. An important reason is that although a strategy appears to be broadly based on an overall level, the same strategic thinking is not necessarily found on the lower level in the organisation (Frølich et al. 2014). In this study, support from academic staff was considered more important than support from students or administrative support. This may be particularly relevant for technical universities, as staff at the engineering is found less positive than the average for all professions to student exchanges at undergraduate degree (Frølich et al. 2014). The relatively low score for importance of administrative staff may be linked to the expectation that they do their job anyway, whereas academic staff typically has it as an extra task, which they are not credited for. However, implementation will not be complete if not all groups are working in the same direction. This is supported by findings of Bartell (2003), who reports that both the collegial process and the executive authority are necessary to develop a functional and embedded, university-wide internationalisation; Centre for International Mobility (CIMO) et al. (2013), who points out that teachers, students, counsellors and international coordinators are all crucial when wanting to overcome the academic barriers to international student mobility; and Horta (2009), who found a positive association between the internationalisation of the academic staff and the internationalisation of the student population, particularly the doctoral student population.

5.5 Barriers and key components of successful internationalisation

National policies, finance, communication and internal resistance seem to be the four main barriers for successful internationalisation at the institutions in this study. However, the barriers also form part of the solution. Key components, which are crucial for developing and implementing a successful strategy for internationalisation, are good organisational support, dialogues and communication. For the practical implementation, a clear action plan as well as broad spectre of instruments and activities are highlighted.

Many interviewees reported that national policies which concern internationalisation at universities may have a large impact on institutional strategies and organisational change, and some reported that there is dialogue with relevant ministries. The introduction of fees for non-European students is a specific barrier which restricts the Danish and Swedish

universities room for manoeuvring strategically, then again challenging recruitment of good students. A more general barrier is the absence of governmental interest in internationalisation, as reported from the Danish case. However, it is also described that a national policy which balances between being broad and specific can be good support and guidance for universities to extend their activities abroad. This statement is in line with the general view that universities are intellectually autonomous institutions in accordance with the Magna Charta and must have a certain degree of independence in relation to other institutions in society (Ekman 2005).

In a comparative study of European universities, Bleiklie and Michelsen (2013) described three major trends which characterise policy change: 1) stronger institutional hierarchies, 2) stronger inter-institutional networks and 3) standardisation and formalisation. This corresponds well with the 'new' form of internationalisation, where internationalisation is formalised and standardised (Figure 1), influenced by national and international policies. The same study reported that e.g. Norway has had a relatively steady incremental process in contrast to the forceful shift in British higher education policy back in the 1980s. The state driven Nordic (and German) approach versus the market driven Anglo-American approach to internationalisation (Toyoshima 2007) are two different paths for internationalisation (Graf 2009). With internationalisation of technical universities found to be path dependent (Horta 2009), a change like the new national policy of fee-paying for 'third-country students' in Denmark and Sweden may lead to a long-term trend that universities in these countries will outperform other Nordic higher education institutions when it comes to strategic international marketing and recruitment (Guhr 2015), although they see it as a barrier for the time being.

Lack of finances as a barrier for internationalisation is mentioned by some interviewees. This is typically linked to internal activities, e.g. changing curriculum and teaching into English. Lack of financing for external activities, e.g. partnership projects, which are typically part of national and international funding schemes, were not mentioned as a barrier. However, for some students, lack of funding can be a direct barrier for individual internationalisation. Globally, there is consensus with regard to limited funding being a major obstacle in internationalisation (Egron-Polak and Hudson 2014).

A study by Heide et al. (2002) on implementation of strategies found that the major implementation barriers are related to various types of communication problem. Communication problems are also observed in this study, as many respondents ask for clear ambitions and communication from the top leaders and throughout the organisation. At the same time they also describe how they as administrative officers and leaders in the organisation provide organisational support for the process and communicate with many units and persons at their respective institutions in order to establish formal as well as informal dialogue about internationalisation.

The results from this study indicate that concrete action plans as a supplement to overall strategic aims may be very helpful in the implementation phase. Using the 'Intended policies to implemented practices model' (Figure 3), the intended policy is the strategy documents for internationalisation and the implemented policy is the action plan or similar documents. However, in order to end up with actual practices and performance outcomes, leaders, academic and administrative staff and students, who are all stakeholders in the internationalisation process, need to understand and acknowledge the policy. In this study it was reported that some academic departments and individuals were negative to internationalisation. In such cases, where employees are not positive to the strategic aims, there will not be positive behavioural outcomes and the individuals and ultimately the institution will have low performance outcomes. Here leadership and communication becomes very relevant for the performance (Marchington and Wilkinson 2012).

The weak point for technical universities may be that while some academic departments may have a strong culture for internationalisation based on international staff or research projects, other units within the same institution have negative attitudes towards internationalisation and perhaps even to top-down strategies and approaches. This means that the performance link from intentions to implementation may not be uniform across a given institution. Because past events and decisions can make 'policy paths' with a lasting effect on later strategic decisions (Johnson et al. 2014, p. 143), universities, which already have experience with and user expectations about internationalisation, may use their capabilities to build a strategy around it. This is referred to as 'institutional thinking' and 'DNA' by some of the interviewees. However, younger institutions without this base or with a non-uniform approach to internationalisation have to create new paths, and will not have

the competitive advantage of past experience and culture. In line with the findings of this study, Bartell (2003) describe that both the collegial process and the executive authority are necessary to make the university able to apply a practical, embedded and university-wide internationalisation. He underlines that internationalisation, viewed as an organisational adaptation, requires its articulation by the leadership while simultaneously institutionalising a strategic planning process that is representative and participative in that it recognises and utilises the power of the culture within which it occurs.

Finally, a practical key component of internationalisation is to have a broad toolbox of actions and activities when implementing internationalisation. These activities are recognised worldwide, but in a Nordic context it seems to be student and staff mobility; networks and agreements; attracting good students and researchers; and strategic partnerships.

6. Conclusions

6.1 What is a winning strategy for internationalisation?

Universities have to develop new flexible and adaptive structures to respond adequately to external complexity, and this also affects strategies for internationalisation. A winning strategy must show what the institution wants, where it should go, and how to do it. Using the framework of the exploring strategy model, a successful strategy for internationalisation should include all three elements, position, choices and action, but the elements might have different weight and impact on the overall result and should interact.

A winning strategy should take into account the *strategic position*. This means that the strategy should consider the environment as well as its strategic capabilities. The environment concerns both global megatrends, regional trends, national policies and how the university positions itself in relation to other universities. The behind lying business analyses are not part of the external strategy documents, but the strategy documents show that the Nordic technical universities base their strategies on global and national trends and that they are ambitious. This goes for the reflection of global trends of competition versus the traditional Nordic model of cooperation, the focus on comparative aspects with words like 'level' and 'recognised', and for the strong focus on strategic partnerships. Thus, with internationalisation being a way for universities to meet global changes, a winning strategy needs to take into account global megatrends and spot the trends which are relevant to incorporate into the university's own strategic position. For the strategic capabilities, it was found that only 1/3 of the strategies had a triple-focus on internationalisation of the institutions. It is anticipated that an institution that works actively to anchor the strategy in both academia and administration will have better strategic advantages than those focusing on academia (research and education) solely. This may even be more important with the increasing competition amongst universities nationally, regionally and globally. The strategy document in itself can only to a limited degree contribute to cultural embeddedness of internationalisation at the institution, and leadership is needed for strengthening of the internal linkages, thereby linking to elements of strategy in action.

The *strategic choices* are paramount to determine which direction the institution should go, and which methods to use to pursue the strategic direction. The stories told in the strategy documents in this study range from more humble documents meant for internal use to costly lay-outed brochures with a clear external focus highlighting the ambitions and performance of the institution. However, it is not the layout or the number of times internationalisation is mentioned in a strategy document that makes the strategy a success. In addition to clearly indicate the vision, mission and goals of the institution, the strategy should prioritise the goals. A winning strategy cannot have it all, and the institution needs to define and prioritise which rationales for internationalisation are the most important. The apparent shift in rationales in this study from a more traditional approach of internationalisation to a new form is an indication that new motivation for internationalisation covers much more than traditional student- and staff mobility. Already now, and increasingly over the years, the focus on competition and strategic partnerships and alliances will intensify. Overall, the information gathered in this study points to the 'new' model of internationalisation as most successful. In this model, institutional policies for internationalisation research and education is connected and internationalisation is part of a more general development at the institutions.

Implementation is putting the *strategy in action*. A good linkage between strategy and practice is needed, as a well-written strategy does not do the job alone, and the implementation of strategy is the proof of how well the strategy works. This study shows that implementation is a very important part of making a strategy successful. Based on the response from interviewees, it is a definite advantage supplement the strategy document with an action plan, integrated or separate, to ensure ambitions are followed up at a more concrete level and can be evaluated. Further, communication of and dialogue about the ambitions of internationalisation is important, and internally more than externally, especially when institutions are in a phase of change. It should be understood that internationalisation is not a simple development process, especially at large institutions with a tradition of autonomy. Without dedicated communication, the strategy will not be adequately integrated and embedded in the organisation. The communication tasks goes especially for the top leader level to make the vision and goals clear, and all the way throughout the

organisation to academic staff and students in order to create the necessary actions. Efforts with regard to dialogue, information and acceptance at all institutional levels (institutional, faculty, departments) are also found to be very important.

6.2 Evaluation of theory, models and research questions

The exploring strategy model (Johnson et al. 2014) was used as the basis for analysing and evaluating the three elements of strategy, their relations and relative importance. The *strategic position* was analysed by looking at the environment including megatrends (section 1.2), Nordic trends (section 1.3), the influence of national politics (section 5.4), and the strategic capabilities (Appendix II) including organisational support (section 4.2) and culture and paths (interviews and Figure 3). The *strategic choices* were analysed by looking at the strategic direction, which means 'products' and markets and which methods the institution will use to get there. This is analysed by use of the model of old versus new internationalisation (Figure 1), the institutional motivation (section 2.5), and by looking at the schism between cooperation and competition (sections 4.2, 4.3). The *strategy in action* was analysed by looking at how the strategies have developed in the organisations (interviews), the suitability (do they address key issues) (section 4.2, 4.3) and acceptability (meeting the expectations of the stakeholders) (section 4.4), feasibility (does it work in practice) (questionnaire and interviews, section 4.5) and leadership (section 4.4).

When using this theoretical model it became clear that the model is interconnected by nature and the three elements of the model influence and interact with each other. This can make it challenging to keep the elements apart in the process of data gathering and analysis and is also mentioned by Johnson et al. (2014, p. 189). It also became clear that all three elements need not to be of the same size or importance for a successful strategy. With all the analysed strategies having a relatively good grip on the strategic position, it seems to be the strategy in action element which is the one that makes the difference and influences which strategy is best implemented. This links nicely to the human resource performance link by Marchington and Wilkinson (2012), where the implementation of an intended policy will only have effect on the performance outcomes if the stakeholders involved, both leaders and workers, understand and behave according to the intended policy.

The research questions were partly related to the three elements of the exploring strategy model. They were not designed to fit the model, but rather to look at some of the critical elements of strategies and their implementation for this case. Therefore the current trends at universities in the Nordic region, and technical universities in specific, influenced the way the research questions were designed, e.g. putting specific focus on institutional rationales and the importance of different stakeholder groups for strategy implementation. Overall, the theories and models applied contributed to the structural organisation of the study and secured that relevant aspects of theory on strategy and its implementation were thoroughly analysed and discussed.

6.3 Limitations and possibilities

The strategy documents, which form the basis in this study, are under revision at some institutions. This was mentioned by some of the leaders of internationalisation activities, who were interviewed, and also clear when the documents were downloaded from the external websites in November 2015. Here it was evident that some strategies expired in 2015 and were to be replaced by new strategies. Although new strategies might have a different focus or approach to internationalisation, the strategies available in November 2015 were used to make an equal comparison.

With a response rate 48-56% for the questionnaire, the results of the questionnaire are considered a reliable base for the administrative view on the success of the strategies for internationalisation. A recent study by IAU (2014) had a 20% response rate, but had a much larger geographical scope with 6.879 higher education institutions worldwide. A study by Centre for International Mobility (CIMO) et al. (2013) among students regarding exchange studies abroad had a response rate of 13.5%, but for students, one would possibly expect a lower obligation to respond than employed staff.

Some institutions responded only partially. One respondent replied that the questionnaire was too general: *"...the questions are too general and I cannot answer on behalf of the whole institution. When I came to the questions about how motivated administrative/academic/students are for internationalisation it becomes too general. On such a large institution like ours, it varies throughout the scale and it becomes impossible to answer the questions"* and another respondent pointed out that he/she had answered the survey as a staff member at

a specific university and faculty or school, thus, the opinions are expressed from his/her own point of view. Such feedback is important information for the design of future surveys, and also indicate that for large institutions it is difficult for individuals to speak out on behalf of the whole organisation, even though the strategy document covers the whole institution.

The five interviewees, out of the total population of 27 universities for interviews, were a deliberate sample of cases, representing institutions with known successful outcomes of their work with strategies for internationalisation. It can be assumed that if internationalisation does not hold under the best conditions, it will not hold anywhere else.

The advantages of a case study is that there is high internal validity and a more complete understanding of the subject. This case study is based on direct observations, and with the multiple sources of data, it was possible to validate by triangulation of the data. Finally, the case study is meaningful to the subjects (universities). The disadvantages are that the case study has low external validity and low generality. This makes comparative analysis difficult, and the study is difficult to replicate.

6.4 Perspectives and need for new research

It is an interesting finding that there seem to be discrepancy between the rationales for internationalisation described in the strategy documents to the perception of academic officers and leaders working with the implementation of internationalisation on a daily basis. This may indicate that the strategy changes meaning when implemented, that life is lived in practice, not in the documents, and that new trends are absorbed faster than strategy documents are updated. With fast changes in at the international arena for research and higher education, strategies should be flexible enough to catch up and mitigate to changes happening at a faster pace than the traditional strategy period. The need for pro-activity is stressed by Calderon (2015) who advices institutions involved in international education to stay abreast of future developments and become more proactive in adjusting their internationalisation strategies, as circumstances require. In the introduction, it was stated that universities are international(ising), and this may take place both abroad and at home. A recent example, which is very relevant for the Nordic region, is the migration wave, and how universities and accreditation institutions now discuss how to administer and take

responsibility for refugees with an academic background. Here, internationalisation is standing at the doorstep of Nordic universities in a new way.

With internationalisation being increasingly professionalised, standardised and managed top-down, there may be a risk that the values of the old model of internationalisation are being lost. However, the new model with intensified organisational management may also make the work with internationalisation more robust, ensuring administrative support and long-term direction to what previously was loose connections based on contact between individual researchers. It would be interesting to look further into the interaction of academia and administration, especially with strategies for internationalisation becoming more and more embedded in the overall strategies.

The link between internationalisation and increased quality in research and education is often promoted (e.g. STINT 2014, UHR 2015), but the link is rather loose and difficult to define and prove causality for. However, it would be highly useful for future strategies of internationalisation, integrated or not, that the impact of internationalisation on quality is better understood. Recently, the Norwegian minister of higher education pointed out five factors which should be part of the common understanding of quality (Isaksen 2016): 1) higher ambitions on students' behalf, 2) activating and varied learning methods, 3) creating a culture of quality in the overall strategies and down to study programs, 4) integrating students in the academic community and 5) ensuring interaction with work life. All five factors can be related to the benefits of internationalisation and it would be relevant to study the causality in the linkages and effects of such actions for quality in relation to internationalisation. Further, it would be relevant to research and develop future scenarios (Karlsen and Øverland 2010) for the university sector in the Nordic region. This could be a very useful tool for the strategic development of the higher education institutions in the region and as a platform for political discussions on the long-term directions and visions for the university sector.

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Appendix I: Four dimensions of success with internationalisation

Source	Strategy	Management	Faculty/Research	Students/Education
ACE ⁸	Articulated commitment	Organisational infrastructure External funding	Institutional investment in faculty	Academic offerings International students and student programs
CHE ⁹	International reputation International networking	Management in general Administrative staff resources	International networking in research International research projects	International networks for teaching and studies Study programmes/curricula
ECA ¹⁰	Intended internationalisation	-	Composition of staff facilitates. Staff members with sufficient internationalisation experience, intercultural competences and language skills. The services provided to the staff (e.g. training, facilities, staff exchanges) are consistent with the staff composition and facilitate international experiences, intercultural competences and language skills.	Composition of the student group in line with the programme's internationalisation goals. Adequate internationalisation experience gained by students. Curriculum content and structure give necessary means for achieving international and intercultural learning outcomes. Teaching methods suitable for achieving international and intercultural learning outcomes. Learning environment suitable for achieving international and intercultural learning outcomes.
EFMD/ EQUIS ¹¹	Strategy and policies as regards internationalisation	Processes and resources available for the implementation of the strategy	Recruitment of non-nationals to the faculty and International experience of faculty. Ability of faculty to teach in English. Foreign language skills of faculty. Involvement of visiting professors and opportunities for faculty to serve as visiting professors abroad. Involvement of faculty in international networks. Participation in international conferences.	Recruitment of students from other countries. Exchange programmes provide a two-way flow of students. Intercultural exchange in the classroom. Internships/ project work across borders. International placement of graduates. Language ability of graduates. Internationalisation of programmes (courses in English, international perspectives, joint

⁸ American Council on Education (ACE), see Green and Olson (2003).

⁹ The Centre for Higher Education Development (CHE), see Brandenburg and Federkeil (2007).

¹⁰ European Consortium for Accreditation (ECA), see Aerden (2013).

¹¹ The EFMD Accreditation for International Business Schools EQUIS, see EFMD (2016).

			Research and publication of an international nature.	courses, internships, case studies and learning materials).
Erasmus ¹²	Cooperation with partners in other EU or non-EU countries in the framework of a clear strategy for internationalisation	Recognise the importance of, and provide visibility to, the results achieved by staff members engaged in individual mobility or in cooperation projects with strategic partners.	International credit mobility of individuals and Erasmus Mundus Joint Master Degrees promoting the mobility of learners and staff from and to Partner Countries.	<p>International credit mobility of individuals and Erasmus Mundus Joint Master Degrees promoting the mobility of learners and staff from and to Partner Countries.</p> <p>Outline a clear policy towards the development of integrated, transnational teaching activities (joint courses, modules, curricula, double/multiple/joint degrees)</p> <p>Capacity-building projects in higher education promoting cooperation and partnerships that have an impact on the modernisation and internationalisation of higher education institutions and systems in Partner Countries.</p>
NAFSA ¹³	The institution's mission or planning documents contain an explicit or implicit statement regarding international education	Evidence of genuine administrative or even board-level support for internationalisation.	<p>Internationalisation in research and/or faculty exchange.</p> <p>Campus-wide internationalisation has had demonstrative results within the faculty</p>	<p>Campus widely internationalized across schools, divisions, departments and disciplines.</p> <p>Commitment to internationalisation is reflected in the curriculum.</p> <p>International dimension in off-campus programs and outreach</p> <p>Institutional support to education abroad, international faculty, scholars and students</p>

¹² Erasmus Charter for Higher Education 2014-2020, see European Commission (2014).

¹³ Association of International Educators (NAFSA), see Green (2012).

Appendix II: Short description of universities

Information was obtained from the external websites of the universities January 2016.

Denmark

Aalborg University (AAU)

AAU is a young, public university with 21.000 students and 3.500 academic staff. AAU was established in 1994, based on the former Aalborg University Center. The engineering faculty dates back to 1963, when Ålborg Teknikum was established. Aalborg University is located mainly in Aalborg, but also has campuses in Esbjerg and Copenhagen. AAU has a strong focus on interdisciplinary, inter-faculty studies. The main teaching and study form at AAU is problem based and project organised learning. AAU is ranked 201-250 on THE (2016) and has 15% international students. AAU is member of the network European Consortium of Innovative Universities (ECIU), European Network for Training and Research in Electrical Engineering (ENTRÉE) and Conference of European Schools for Advanced Engineering Education and Research (CESAER). Source: www.aau.dk, https://en.wikipedia.org/wiki/Aalborg_University, <https://www.timeshighereducation.com/>

Aarhus University (AU)

AU is a public multi-disciplinary university founded in 1928. It is Denmark's second oldest university and the largest in number of students. In 2012, the Aarhus School of Engineering merged with AU. The engineering faculty dates back to 1915 (Århus Teknikum). AU is organised with four faculties (Arts, Health, Business, and Science and Technology) and has over 38.000 students and 4.500 academic staff. The university has ambitions for talent development and global impact. In recent years, AU has been moving up in international university rankings, and is now ranked 106 on THE (2016) and has 14% international students. AU is a member of the Coimbra Group, an association of long-established European multidisciplinary universities of high international standard. Source: www.aau.dk, https://en.wikipedia.org/wiki/Aarhus_University, <https://www.timeshighereducation.com/>

Technical University of Denmark (DTU)

DTU is a profiled public polytechnic university in Denmark with 10.000 students and 2.500 academic staff, located just north of Copenhagen. DTU was founded in 1829 (Den Polytekniske Lærestanstalt) and became a university by name in 1994. DTU has high international ranking (THE 167 in 2016) described itself as a leading technical elite university at the international arena. DTU aims to be among the five leading technical universities in Europe. DTU is a member of EuroTech Universities Alliance and NordicFiveTech. About 18% of the students are international. Source: www.dtu.dk, https://en.wikipedia.org/wiki/Technical_University_of_Denmark, <https://www.timeshighereducation.com/>

University of Southern Denmark (SDU)

SDU is a young public multi-campus university with both traditional disciplines, business and engineering studies and ca. 27.000 students and 2.300 academic staff. SDU was formed in 1998 by a merger of Odense University (founded 1966), a business school and a university centre. The engineering faculty dates back to 1905 (Ingeniørhøjskolen Odense Teknikum). After a series of recent mergers, SDU now has seven campuses in southern Denmark and five faculties (Humanities, Science, Engineering, Social Sciences and Health Sciences). SDU has strong regional anchoring and an international outlook. The regional focus has resulted in large donations from industry giants in the region. SDU is ranked 301-350 on THE (2016). 16% of the students are international. Source: www.sdu.dk, https://en.wikipedia.org/wiki/University_of_Southern_Denmark, <https://www.timeshighereducation.com/>

Finland

Aalto University (Aalto)

Aalto is a foundation-based multidisciplinary university established in 2010 as Helsinki University of Technology (from 1849), the Helsinki School of Economics and the University of Art and Design Helsinki were merged. Helsinki. The idea of the merger was to create a new innovative university merging science and technology, design and art, and business and economics. The fundamental shift towards multidisciplinary learning has contributed considerably to the rise of Helsinki as a hotbed for startups. Aalto now has 20.000 students, making it Finland's 3rd largest university. About 13% of the students are international. Aalto is ranked 251-300 on THE (2016). Aalto is a member of NordicFiveTech, Consortium Linking Universities of Science and Technology for Education and Research (CLUSTER), Conference of European Schools for Advanced Engineering Education and Research (CESAER), University of the Arctic (UArctic). Source: <http://www.aalto.fi/en/>, https://en.wikipedia.org/wiki/Aalto_University, <https://www.timeshighereducation.com/>

Lappeenranta University of Technology (LUT)

LUT is a young public university, which gained university status in 2003. The Lappeenranta Technical College dating back to 1969. LUT has 5.000 students and 1.000 academic staff. Research and education is organised in three schools (Technology, Industrial Engineering and Management, and Business). LUT's strategic focus areas are green energy and technology, and the creation of sustainable competitiveness. LUT regards itself an entrepreneurial and innovative university. Located near the eastern boundary of Finland, the university also offers broad expertise related to Russia. 19% of the students are international. LUT is ranked 501-600 by THE (2016). Source: <http://www.lut.fi/web/en>, https://en.wikipedia.org/wiki/Lappeenranta_University_of_Technology, <https://www.timeshighereducation.com/>

Tampere University of Technology (TUT)

TUT is young foundation-based university, established in 1965 as a branch of Helsinki University of Technology and became an independent university in 1972. TUT is located in Tampere, which is the most important industrial centre in Finland. TUT has 9.000 students and 1.800 academic staff and conducts research in the fields of technology and architecture. The university is organised with four

faculties (Business and Built Environment, Computing and Electrical Engineering, Engineering Sciences, and Natural Sciences). 13% of the students are international. TUT ranks very high on industry collaboration and the ambition is to be Finland's premier and most international technology-oriented community of students and scholars. TUT is ranked 401-500 by THE (2016). TUT is a member of European Society for Engineering Education (SEFI). Source: <http://www.tut.fi/en/home>, https://en.wikipedia.org/wiki/Tampere_University_of_Technology, <https://www.timeshighereducation.com/>

University of Oulu (Oulu)

Oulu is a multi-faculty public university, which gained university status in 1958. The university has the northernmost location of the Finnish Nordtek universities. Oulu has seven faculties (Biochemistry and Molecular Medicine, Education, Humanities, Information Technology and Electrical Engineering, Science, Medicine, Technology) and three schools (Business, Mining, Architecture) making it one of the biggest and the most multidisciplinary universities in Finland. The university has 16.000 students of which 9% are international and 1.900 academic staff. Oulu is a member of the Compostela Group of Universities, University of the Arctic (Uarctic). Oulu is ranked 351-400 by THE (2016). Source: <http://www.oulu.fi/english/>, https://en.wikipedia.org/wiki/University_of_Oulu, <https://www.timeshighereducation.com/>

University of Turku (UTU)

UTU was established as a private university in 1920, based on a demand for a purely Finnish university. The university was made a public institution in 1974. UTU aims to be an internationally competitive research university. UTU is a large multi-faculty university with seven faculties (Humanities, Mathematics and Natural Sciences, Medicine, Law, Social Sciences, Education, Economics) and 20.000 students and 1.900 academic staff. 11% of the students are international. UTU is the only exclusively Finnish language university in Finland and located at the same campus area as Åbo Akademi University, the two universities have close collaboration in research and education. UTU is ranked 301-350 by THE (2016). UTU is a member of Coimbra Group. Source: <http://www.utu.fi/en/Pages/home.aspx>, https://en.wikipedia.org/wiki/University_of_Turku, <https://www.timeshighereducation.com/>

University of Vaasa (UVA)

UVA is a public and regional university, which has evolved from a school of economics (1968) to a university with three faculties (Business, Philosophy, Technology), which was labelled university in 1991. UVA is a business-oriented university with academic focus on business, administrative sciences, languages and technology. UVA has 5.000 students and 300 academic staff. About 6% of the students are international. Source: <http://www.uva.fi/en/>, https://en.wikipedia.org/wiki/University_of_Vaasa, <https://www.timeshighereducation.com/>

Åbo Akademi University (ÅAU)

ÅAU is a public university established 1918, located in Åbo/Turku and the only exclusively Swedish language university in Finland. Åbo Akademi was a private institution until 1981, when it was turned into a public institution. ÅAU has four faculties (Arts, Psychology and Theology; Education and Welfare Studies; Social Sciences, Business and Economics; and Science and Engineering) and over 7.000 students and 700 academic staff. 11% of the students are international. ÅAU is particularly tasked with educating Swedish-speaking experts to satisfy the future needs in Finland. ÅAU is a member of the Coimbra Group, an association of long-established European multidisciplinary universities of high international standard. Source: <http://www.abo.fi/public/en/>, https://en.wikipedia.org/wiki/%C3%85bo_Akademi_University, <https://www.timeshighereducation.com/>

Iceland

Reykjavik University (RU)

RU is a young private campus university located in Reykjavik. RU was established as university in 1998, originating from the School of computer science (1988). The Technical University of Iceland (THÍ) was merged with RU in 2005. RU is organised with four academic schools (Law, Business, Computer Science, and Science and Engineering) and has 3.500 students and 250 staff. Teaching is based on an interdisciplinary approach and international orientation. Source: www.ru.is, https://en.wikipedia.org/wiki/Reykjav%C3%ADk_University, <https://www.timeshighereducation.com/>

University of Iceland (HI)

HI is a public research university, located in Reykjavík. HI is Iceland's oldest and largest institution of higher education, established in 1911. The technical faculty was established during WW II as a merger of several technical schools. HI has 14.000 students and 700 academic staff and research and education is organised in five schools (Social Sciences, Health Sciences, Humanities, Education, Engineering and Natural Sciences). Ca. 8% of the students are international. HI has an ambitious long-term goal of becoming one of the top 100 universities in the world. Presently, HI is currently ranked 251-300 by THE (2016). Source: <http://english.hi.is/>, https://en.wikipedia.org/wiki/University_of_Iceland, <https://www.timeshighereducation.com/>

Norway

Norwegian University of Science and Technology (NTNU)

NTNU is a large, public university with national responsibility for higher education in engineering and technology. In addition to engineering and the natural and physical sciences, the university offers advanced degrees in social sciences, arts, medicine, architecture and fine art. The history of NTNU dates back to the establishment of Norges Tekniske Høgskole (NTH) in 1910. In 1996, NTNU became a university. With a recent merger, NTNU is now Norway's largest university with 39.000 students and over 3.000 academic staff and three campus (Trondheim, Gjøvik and Ålesund.) The objective is to

become internationally outstanding. NTNU is currently ranked 351-400 by THE (2016). NTNU has 11% international students. NTNU is a member of NordicFiveTech, Top Industrial Managers for Europe (TIME), Conference of European Schools for Advanced Engineering Education and Research (CESAER), European Society for Engineering Education (SEFI), and European Leuven network (ELN). Sources:

<http://www.ntnu.no/>,

https://en.wikipedia.org/wiki/Norwegian_University_of_Science_and_Technology,

<https://www.timeshighereducation.com/>

University of Agder (UiA)

UiA is a young, regional, public university established in 2007 with two campuses. The institution was established as a university college in 1994 with the merger of six colleges and was granted its status as a university in 2007. The engineering faculty has its roots in the Agder Regional College of Technology, which was established in 1967. The university is seen as a driving force for societal and regional development. UiA has six faculties (Engineering and Science, Fine Arts, Health and Sport Sciences, Humanities and Education, Social Sciences, Business and Law), ca. 11.000 students, and 700 academic staff. Source: <http://www.uia.no/>, https://en.wikipedia.org/wiki/University_of_Agder,

<https://www.timeshighereducation.com/>

University of Stavanger (UiS)

UiS is a young, regional public university established in 2004. The technical engineering college dates back to 1969. UiS has three faculties (Social Sciences, Arts and education, and Science and technology), 10.000 students and 1000 academic staff. UiS has 11% international students. UiS has focus on innovation, entrepreneurship and close collaboration with industry in the region. UiS is member of the network European Consortium of Innovative Universities (ECIU). Source: www.uis.no,

https://en.wikipedia.org/wiki/University_of_Stavanger, <https://www.timeshighereducation.com/>

UiT The Arctic University of Norway (UiT)

UiT is a public university established in 1968 and the world's northernmost university. UiT is a multi-faculty university with ten faculties and after recent mergers in 2013 and 2016, UiT now has over 15.000 students and 2000 academic staff. UiT has a regional anchoring combined with a special responsibility for international cooperation within the Arctic. UiT is ranked 351-400 at THE (2016).

UiT has ca. 10% international students. UiT was a founding member of University of the Arctic (UArctic). Sources: <https://uit.no/startside>, https://en.wikipedia.org/wiki/University_of_the_Arctic,

<https://www.timeshighereducation.com/>

Sweden

Blekinge Institute of Technology (BTH)

BTH is a small, young, regional university established in 1989 with focus on applied IT and innovation for sustainable growth. The university got the right to award doctoral degrees in engineering in 1999. BTH has two campuses in Blekinge (Karlskrona and Karlshamn), two faculties (Engineering and

Computing), 7000 students and 500 academic staff. BTH is internationally oriented and works actively with student recruitment globally. Source: <http://www.bth.se/eng/>, https://en.wikipedia.org/wiki/Blekinge_Institute_of_Technology, <https://www.timeshighereducation.com/>

Chalmers University of Technology (Chalmers)

Chalmers is a private, polytechnic university located in Gothenburg. Chalmers obtained university status in 1937 and changed from public to limited company in 1994 with all shares owned by the Chalmers University of Technology Foundation. The university has roots back to 1829 as an industrial school (Chalmersska Slöjdskolen). Chalmers focuses on research and education in technology, natural science, architecture, maritime and other management areas and has 17 departments for research and education. Chalmers has ca. 10.000 students and 1900 academic staff and approximately 40% of Sweden's graduate engineers and architects are educated at Chalmers. Ca. 15% of the students are international. Chalmers has wide international recognition and is ranked 201-250 by THE (2016). Chalmers is member of NordicFiveTech, IDEA League, Conference of European Schools for Advanced Engineering Education and Research (CESAER), Top Industrial Managers for Europe (TIME) and UNITECH International Society. Source: <http://www.chalmers.se/sv/Sidor/default.aspx>, https://en.wikipedia.org/wiki/Chalmers_University_of_Technology, <https://www.timeshighereducation.com/>

Karlstad University (KAU)

KAU is a young, regional university located north of Vänern, established as a university in 1999. Before that, the institution was Karlstad University College since 1977 and originally it was a branch of the University of Gothenburg. KAU has two faculties (Arts and social sciences and Health, science and technology), approximately 16.000 students and 800 academic staff. KAU has focus on regional development and aims to be one of the best universities in Europe with regard to external cooperation. Source: <https://www.kau.se/en>, https://en.wikipedia.org/wiki/Karlstad_University, <https://www.timeshighereducation.com/>

KTH Royal Institute of Technology (KTH)

KTH is a public university in Stockholm with high reputation. KTH was founded in 1829 as Sweden's first polytechnic. In 1927, KTH was granted the right to confer its own doctorates. KTH is now one of Scandinavia's largest institutions of higher education in technology with over 15.000 students. 21% of the students are international. KTH is one of the leading technical universities in Europe and highly respected worldwide, within technology and natural sciences. KTH is ranked 155 by THE (2016). KTH is member of NordicFiveTech, Consortium Linking Universities of Science and Technology for Education and Research (CLUSTER), Conference of European Schools for Advanced Engineering Education and Research (CESAER), Top Industrial Managers for Europe (TIME) and Partnership of a European Group of Aeronautics and Space Universities (PEGASUS). Source: <https://www.kth.se/>, https://en.wikipedia.org/wiki/Royal_Institute_of_Technology, <https://www.timeshighereducation.com/>

Linköping University (LiU)

LiU is a young, public university, established in 1975, based on the Linköping University College (1970). LiU has four faculties (Science and Engineering, Medicine and Health Sciences, Educational Sciences, and Arts & Sciences) and four campus areas in Linköping, Norrköping and Stockholm. LiU is known for multidisciplinary and interdisciplinary research and education and prioritises cooperation with regional business and community. LiU has 27.000 students and 2.000 academic staff. 10% of the students are international. LiU is member of the network European Consortium of Innovative Universities (ECIU). LiU is ranked 251-300 by THE (2016). Source: <http://www.liu.se/?l=en>, https://en.wikipedia.org/wiki/Link%C3%B6ping_University, <https://www.timeshighereducation.com/>

Luleå University of Technology (LTU)

LTU is a young technical university, which was granted university status since 1997. The origin is Luleå University College, founded in 1971. LTU is Scandinavia's northernmost university of technology and has four campuses, located in Luleå, Kiruna, Skellefteå and Piteå. LTU has six departments (Business Administration, Technology and Social Sciences, Arts, Communication and Education, Health Sciences, Civil, Environmental and Natural resources engineering, Computer Science, Electrical and Space Engineering, and Engineering Sciences and Mathematics), 16.000 students and 500 academic staff. About 3% of the students are international. LTU is a member of UArctic. Source: <http://www.ltu.se/?l=en>, https://en.wikipedia.org/wiki/Lule%C3%A5_University_of_Technology, <https://www.timeshighereducation.com/>

Faculty of Engineering, LTH, Lund University (LTH)

LTH is one of the eight faculties at Lund University. LTH has been a faculty at Lund University since 1969. Formerly it was known as Tekniska Högskolan i Lund. Lund University is one of northern Europe's oldest and most prestigious universities, founded in 1666 and ranking among the world's top 100 universities. Lund University is ranked 90 by THE (2016). LTH is responsible for education and research in engineering, architecture and industrial design and has 19 departments, more than 9.000 students and 1000 academic staff. 7% of the students at LTH are international. Lund University is a member of Universitas 21 and League of European Research Universities (LERU). Source: <https://www.lth.se/>, [https://en.wikipedia.org/wiki/Faculty_of_Engineering_\(LTH\),_Lund_University](https://en.wikipedia.org/wiki/Faculty_of_Engineering_(LTH),_Lund_University), <https://www.timeshighereducation.com/>

Mid Sweden University (MIUN)

MIUN is a young, regional, public university, located in the region around the geographical center of Sweden, with three campuses in the cities of Östersund and Sundsvall. MIUN is based on Mid Sweden University College (1993) and obtained university status in 2001. MIUN has two faculties (Human sciences and Science, technology and media), ca. 21.000 students and 800 academic staff. One of MIUN's characteristics is the focus on e-learning and distance education. Research and education is carried out in close co-operation with the surrounding community. MIUN is a member of UArctic. Sources: <http://www.miun.se/en>, https://en.wikipedia.org/wiki/Mid_Sweden_University, <https://www.timeshighereducation.com/>

Umeå University (UMU)

UMU is a large university with university status since 1965. UMU is located in mid-northern Sweden and has its main campus area in Umeå with additional campuses in Skellefteå and Önsköldsvik. UMU has four faculties (Arts, Medicine, Social Sciences, and Science and Technology) and 32.000 students and 2.400 academic staff. UMU aims to strengthen its international position combined with a strong regional commitment. About 7% of the students are international. UMU is ranked 251-300 by THE (2016). UMU is a member of UArctic. Sources: <http://www.umu.se/english/>, https://en.wikipedia.org/wiki/Ume%C3%A5_University, <https://www.timeshighereducation.com/>

Uppsala University (UU)

UU is a large, old public university, established in 1477, the oldest in Sweden. UU has 9 faculties, 45.000 students and ca. 6.000 academic staff. About 12% of the students are international. UU ranks among the best universities in Northern Europe and in international rankings and has strong academic traditions. UU aims to provide excellent research and high quality education for the benefit of society and business on a global level. UU is ranked 81 by THE (2016). UU is a member of the Coimbra Group and the Matariki Network of Universities (MNU). Source: <http://www.uu.se/en/>, https://en.wikipedia.org/wiki/Uppsala_University, <https://www.timeshighereducation.com/>

Appendix III. Words written in direct connection with ‘international’ in the strategies

Acronym	Country	Words written in direct connection with ‘international’
DTU	Denmark	Level, standards, context, technical universities, alliances, elite, students, community, authorities, leading, organizations, provider, levels, quality, alliances, network, competition, node, outreach
SDU	Denmark	outlook, research, partners, students, level, context, staff, funding, considerations, networks, sources, outlook, partnerships, competitive potential, study environment, workplace, collaboration
AAU	Denmark	network, level, research, perspective, cooperation, education, role, competition, competencies, activities, profile, organisations
AU	Denmark	competitiveness, research, teaching, level, collaboration, position, circulation of talent, experience, policy development, elite, standards, ranking, university, mobility, context, post-doctoral students, career, perspective, recognition, activities
Aalto	Finland	field, students, academic elite, competitive research, analyses, panel, evaluation, recognised, environment, accreditation, cultures, research infrastructures, networking, quality, recruitment, educational cooperation, leader, visibility, life, competitive, encounters, standing, recruitment, career model, mobility, visibility, teaching, partnerships, competence, partner, dimension, study, level, standard, cooperation, actors, users, locations, media
LUT	Finland	market, partners, recruit
TUT	Finland	students, scholars, networks, research, environment
Oulu	Finland	university, research, profile, research units
UVA	Finland	outcomes, education, research, successful, experts and leaders, orientation, language, activity, publication, recognized, network, skills, recruitment, environment, cooperation, student, exchange, funding
ABO	Finland	anchorage, standard, scientific community, competitive, research, atmosphere, recognized, assessment, level, profiling, university, student, top-ranking, attractive, publications, visibility, cooperation, recruiting, mobility
UTU	Finland	networking, competitive, research, academic community, environment, recognised, communication, funding, reputation, regarded, cooperation, trends, projects, teacher, exchange, students, doctoral students, programmes, training, role, joint degrees, recruitment, comparisons, staff, ranking, survey
HI	Iceland	collaboration, research, community, criteria, peer-reviewed journals, competitive, funds, quality, standards, grants, languages, venue, jobs, community
RU	Iceland	context, criteria, industry, university, standards, markets, quality
NTNU	Norway	outstanding, academic, evaluations, recognition, standards, level, league, peer review, renowned, community, research, attention, development, working life, collaboration, relationships, reputation, dissemination, leading
UIS	Norway	recognition, university, partners, efforts, research, collaboration, success, elements, oriented, quality, students, networks, MSc programme, semester, marketing, channels, co-authors, exchange, expertise, significance, oriented, institutions
UIA	Norway	respected, orientation, community, academic, accreditation, terminology, collaborative, research, acknowledged, scale, positions, channels, level, challenges, quality, arenas, orientation, background
UIT	Norway	law, quality, standards, recruitment, research frontier, leading, partners, competitive, leader, mobility, level, forefront
BTH	Sweden	cluster, attention, ranking, journal, scientific evaluations, students, collaboration
Chalmers	Sweden	education, acclaimed, hub for education, mobility, collaboration

KAU	Sweden	academic participation, labour market, relevance, mobility, quality, arenas, education, publications, collaboration, research, referee, competitive, exchange, students, promoted
KTH	Sweden	profiles, impact, alliances, market, meeting places, arena, cooperation, recruited, students, tracks, multicultural, profile, universities, scientific community, actors, challenges, alumni, partners
LIU	Sweden	standing, research environment, impact
LTU	Sweden	recognized, communicate, reputation, expertise, academic community
LTH	Sweden	forefront, standard, cooperation, sources, research facilities, audience, experience, networks, recognised, applicants, exchange, skills, guidance, students
MIUN	Sweden	cooperation, quality, research
UMU	Sweden	position, prominent, attractive, partners, collaboration, students, dimension, respected, exchanges, impact, outlook, research network, renowned, leaders, adapted
UU	Sweden	orientation, meeting place, prominent position, academic community, research, funding, university, competition, recruitment, perspective, quality, students, exchange, contexts, comparisons

Appendix IV. Strategy statements relating to internationalisation

The main strategy statement on internationalisation and the statements on internationalisation of the three subjects 'Management', 'Research' and 'Education'.

University	International	Management	Research	Education
DTU	DTU is recognized as an elite technical university, assessed according to the highest international standards. A driving force for welfare and sustainable value creation in Danish society, and should consistently take on the same role in an international context. Being of the same calibre as leading international technical universities: i.e. being an elite university.	Support functions. DTU will maximize its funding of activities within its academic scope by engaging in international outreach activities, including lobbying and creating alliances	Within their respective primary disciplines and fields of interest, DTU's departments will be able to develop and maintain internationally leading research environments.	DTU will offer and develop degree programmes in engineering at BEng, BSc, MSc, and PhD level that match current and future requirements, and which are of the highest standard and quality as measured by international standards.
SDU	Globalisation makes ever-increasing demands on our students and staff being able to navigate and collaborate in an international context. The university has a large number of international students and staff, and we will extend our already high level of internationalisation by aiming to increase the number of students and staff spending time abroad and by attracting more students and researchers from other countries.	No	We will deliver research at the highest international level and make the greatest possible contribution to meeting the challenges facing the world.	The aim of the University of Southern Denmark, then, is to offer as many young people as possible a research-based degree at the highest academic level and with an international outlook.
AAU	AAU will continue to develop its international profile and position within research and education. University researchers and students must be motivated to cooperate across national frontiers and must be well prepared professionally, culturally, and in terms of language skills to act in a globalised world.	AAU will create a good framework for international research and educational environments, for instance through shared information, reception and counselling functions	AAU will utilise our unique combination of academic and profession oriented disciplines to secure strong international research areas across both traditional disciplines such as basic research and application-oriented research.	Be in the lead internationally within the development and application of problem-based project work in education.
AU	The university's participation in the competition for the finest talents among both students and researchers must be intensified, and the international circulation of talent must be strengthened. The university must lead the way in establishing unique, modern research infrastructures that will provide the best possible frameworks for research and will attract top researchers from among the international research community.	No	Aarhus University has a remarkably strong international position in a number of important research areas.	Degree programmes and teaching and learning environments must continue to be internationalised, so that cultural diversity and international experience become strengths to the benefit of all.

Aalto	Our goal for the University's entire operations is to achieve high international quality and recognition.	The international competence of local staff is developed through systematic training. Internationalisation is also part of the administrative and service staff's job profile. Better support services are developed to advance mobility in the community.	Aalto University is an internationally acclaimed, multidisciplinary university where research and education are promoted hand in hand.	Aalto University is an internationally networked, multicultural learning community.
LUT	We work together with the best possible international partners. We recruit the top candidates internationally.	No	Research in high gear. We work together with the best possible international partners. We recruit the top candidates internationally.	No
TUT	Tampere University of Technology is Finland's premier and most international technology-oriented community of students and scholars that is dedicated to promoting the well-being of humanity and sustainable development.	No	Particular strengths include the interaction between fundamental and applied research, broad international networks and high-quality research projects that cut across departmental and disciplinary boundaries.	Tampere University of Technology is Finland's premier and most international technology-oriented community of students and scholars that is dedicated to promoting the well-being of humanity and sustainable development.
Oulu	The objective of the University is to promote internationally high-level free research, education and culture, to strengthen the knowhow that creates well-being, and to assure the availability of highly qualified work force and researcher base in our sphere of influence.	No	The selected, internationally evaluated focus areas and development areas of research are multidisciplinary and of high quality	The objective of the University is to promote internationally high-level free research, education and culture.
UVA	The University of Vaasa is a business oriented university that is internationally and nationally successful and an efficiently networked institution of research and education.	Internationalization: the increasing internationalization of the personnel will be taken into account in the administration and communication.	Research and postgraduate education will become more international. The best research groups will reach a high, internationally recognized, standard.	We have reformed our degree programme structure. All programmes will contain internationalization and business modules.

ÅAU	The task of Åbo Akademi University is to provide an open, Swedish-speaking university environment for quality research and studies with a Nordic and international anchorage.	No	ÅAU will provide researchers with an exceptionally good working environment, and its profile areas will be internationally recognized for research at the highest level.	ÅAU develops Nordic co-operation, joint education (joint examinations and double examinations) with other universities, as well as international student and personnel exchange.
UTU	The University's international reputation is built on the visibility of its research. Success in research leads to international networking, which in turn improves the University's competitiveness and the quality of its operation.	The university has a well-performing service system that supports international researcher, teacher and student exchanges. The University's international communication is efficient. The University has a specialised support system for acquiring and managing international research funding throughout the projects' lifecycle.	The University of Turku is an internationally competitive research university, the operation of which is based on high-quality multidisciplinary research.	The aim of the University is that all degrees include a section that prepares the student for internationalisation. In addition to student exchange or international practical training, this may mean, for example, language teaching, intercultural communication skills, teaching in foreign languages and utilising foreign experts in teaching.
HI	As an international research university, the University makes an important contribution to the academic community, prepares its students to participate in the international community and provides them with training to meet the challenges of the 21st century.	No	The University of Iceland is an international research university that has strong obligations to Icelandic society, culture and language.	The University of Iceland ensures all students equal opportunities for a good education, meeting recognized international quality standards
RU	Reykjavik University is an international university that bases its teaching, research and management on international standards. The University collaborates with leading international universities in these areas and provides students with the skills necessary for working in international markets.	No	Research is evaluated against international criteria and reflects impartiality, professionalism and recognized scientific work ethics.	The University collaborates with leading international universities in these areas and provides students with the skills necessary for working in international markets.
NTNU	NTNU aims to become an outstanding university by international standards. This requires us to have world-class academic environments ourselves, and to seek collaboration with other leading knowledge communities in the world.	An internationally outstanding university depends on the active involvement of students and staff. This requires inclusive leadership and effective collaboration with the student democracy and the	The entire organization upholds quality at a high international level and several academic environments are in the top international league, measured by international peer review.	We attract the best students and staff, and are internationally renowned for the quality of our student life. All the programmes of study are characterized by academic and teaching quality at a

		employees' organizations.		high international level.
UiS	We will be internationally oriented in the continued development of our academic activities. Our educational activities will have an international orientation.	No	We will be internationally oriented in the continued development of our academic activities.	We will offer research-based education of high international quality and learning outcomes which meet the needs of students, the labour market and society.
UiA	The university is to be characterised by an international orientation. UiA will be part of an international academic environment and will pursue reputable, international accreditation in all relevant academic areas.	No	UiA will have good research communities in all academic areas and will in a certain number of these areas be internationally acknowledged as being academically excellent.	The study programmes at UiA are to be sought by students and acknowledged by academic communities both nationally and internationally.
UiT	UiT will offer research-based education of the highest international quality standards	UiT will build knowledge and competence with international partners through education, research and artistic and professional development.	UiT will be a research-driven university with researchers and research groups that are innovative and at the international research frontier in their fields.	UiT will offer research-based education of the highest international quality standards.
BTH	Internationalisation activities at BTH are a mean to meet the requirements of a Swedish institution in today's globalized world and to achieve the university's specific goals and visions.	No	BTH's research is highly international through faculty and doctoral students from many different countries, internationally co-produced articles, participation in international research projects, visiting professors at foreign universities and research training conducted in developing country.	The strategy is to increase the attractiveness of the educational programs by incorporating internationalization as a quality aspect of BTH's educational programs and study abroad packages at esteemed universities.
Chalmers	Through internationally acclaimed education and research combined with a professional innovation process, Chalmers' mission is to become one of the world's most attractive universities.	No	As a local and international hub for education, research and collaboration, Chalmers will provide open, dynamic and transdisciplinary environments and research infrastructures.	Through internationally acclaimed education and research combined with a professional innovation process, Chalmers' mission is to become one of the world's most attractive universities.

KAU	Education and research shall maintain an internationally high quality and be carried out efficiently.	No	Karlstad University shall create long-term and sustainable conditions for research, which will lead to e.g. an increased number of international publications, a higher number of granted research applications and more collaborations with other researchers and societal actors both nationally and internationally.	Our students and our programmes and courses shall be nationally and internationally competitive. International exchange is a natural part of the university.
KTH	KTH operates in an international market, and must be able to compete with other excellent technical universities for the best researchers and students.	No	During this period, KTH will also strive to conclude more strategic alliances with other international universities.	KTH will consequently endeavour to maintain and develop the internationalisation of its educational programmes.
LIU	There are two main motives for internationalization: increased quality of education and research. International experience and perspectives in education, international students in the classroom and on campus all contribute to better education and student experiences. Internationalization helps to strengthen the competitiveness and ability to attract students, staff and resources, and we are measured and evaluated in international rankings about how internationalized we are.	A council for strategic internationalisation is established, a vice principal is responsible for internationalisation, and the post of director of international relations is established. Faculties develop action plans for internationalisation. Monitoring of internationalization will take place in the work of the annual report. The director of international relations should give reports and analysis to the University Board every two years.	In research, it is clear that an internationalized environment has positive impact with enhanced competitiveness both national and international. Produce and disseminate research findings with international impact	Strengthening and developing internationally vigorous research environments that also take responsibility for education and collaboration.
LUT	With our excellence, which is internationally recognized, we conduct outstanding research and enhance the quality of education at the undergraduate level, advanced level and postgraduate level.	No	We are an active part of the international academic community	With our excellence, which is internationally recognized, we conduct outstanding research and enhance the quality of education at the undergraduate level, advanced level and postgraduate level

LTH	The pace of change in society is rapid. Globalisation is the most important external factor influencing LTH and our development is dependent on how well our research, education and administration is internationalised.	Our development is dependent on how well our research, education and administration is internationalised.	We have cutting-edge expertise in a number of fields where research is conducted at the absolute international forefront.	Our programmes and courses are research-based and of high international standard, characterised by pedagogic awareness and teaching skill.
MIUN	Internationalization reflects the fact that research basically is independent of national borders. In the upcoming period, Mid Sweden University should emphasize the strengthening of the integration of our research in the international research community.	No	The research should be conducted in international cooperation and be of a high international quality. Within our profile areas, the researchers of Mid Sweden University should be among the leading experts in the world.	No
UMU	The point of departure for Umeå University is that by 2020 we need to have developed as an internationally prominent university for education and research that also plays a strong role in terms of regional development.	Our services and career paths are internationally attractive in terms of resources and stability.	We are an internationally renowned research university with excellent opportunities for investment in ground-breaking research.	Umeå University has a research-based educational offering at all levels. Internationalisation, skilled teaching staff and collaboration with the outside world contribute towards giving students a high quality education and personal development.
UU	Uppsala University is a local, national and international meeting place for knowledge, culture and critical dialogue. By actively working to increase our international orientation, we are in turn benefiting in Sweden in the long term.	Systematic quality assessment and development, with collegial reviews and international comparisons, will be pursued as an integral part of all our activities.	The ability to attract and to create good working conditions for skilled academic staff is the most important factor for the University's success in the international academic community.	The range of courses taught in English, internationally oriented courses and programmes with an international perspective will be developed, including at Bachelor's level.

Appendix V. Questionnaire to respondents at the NORDTEK universities

Thank you for participating in this survey. The survey is about strategies for internationalisation at Nordic technical universities, and form an important part of my master thesis for the Executive MBA at University of Stavanger.

I hope you will answer the questions as coordinator of international activities at your workplace. It will take approximately 10 minutes to complete the survey. If you experience problems with the survey or have questions about the survey, please contact me at katrine.h.kristensen@uis.no.

What is the name of the institution where you work?

What is your job title?

- (1) Adviser
- (2) Senior adviser
- (3) Head of office
- (4) Head of department
- (5) Other, please specify: _____

Does your institution have a unit (International Office, Office of Foreign Affairs etc.), where international activities are coordinated?

- (1) Yes
- (2) No
- (3) Do not know

Who is overall responsible for internationalisation at your institution?

- (1) Rector
- (2) Vice-rector
- (3) Dean
- (4) Vice-dean
- (5) Head of administration
- (6) Other person - please specify: _____
- (7) Do not know

Does your institution have a separate strategy for internationalisation?

- (1) Yes
- (2) No
- (3) It is integrated in the overall strategy
- (4) Do not know

Does your institution have a separate action plan for internationalisation?

- (1) Yes
- (2) No
- (3) It is integrated in the overall action plan
- (4) Do not know

Do you think it is important to have a written strategy in order to be successful with internationalisation?

- (1) Yes
- (2) No
- (3) Do not know

How would you rate the strategy in terms of usefulness for internationalisation?

Scale 1 to 5, where 1= useless and 5 = very useful

To what extent do you agree or disagree with the following statements about strategic internationalisation at your institution?

My institution is successful with internationalisation.

Scale 1 to 5, where 1= strongly disagree and 5 = strongly agree

Internationalisation is fully embedded in the organisation at my institution.

Scale 1 to 5, where 1= strongly disagree and 5 = strongly agree

How motivated is the management at your institution generally for internationalisation?

Scale 1 to 5, where 1= not motivated and 5 = very motivated

How motivated is administrative staff at your institution generally for internationalisation?

Scale 1 to 5, where 1= not motivated and 5 = very motivated

How motivated is academic staff at your institution generally for internationalisation?

Scale 1 to 5, where 1= not motivated and 5 = very motivated

How motivated are students at your institution generally for internationalisation?

Scale 1 to 5, where 1= not motivated and 5 = very motivated

How would you describe the motivation to internationalisation at your institution?

You may select up to three statements.

- (1) Internationalisation is activities like exchange, study abroad, academic programs, and institutional networking.
- (2) Internationalisation is about results such as student competencies, increased profile or ranking, and new international agreements/projects.
- (3) Internationalisation is driven by primary motivations like academic standards, income generation, cultural diversity, or student and/or staff development.
- (4) Internationalisation is a process in which the international dimension is integrated into education, research, and service to society.
- (5) Internationalisation is the creation of a culture on campus that promotes and supports international understanding.
- (6) Internationalisation is delivery of education to other countries by learning (face-to-face, distance, e-learning etc.) and through different arrangements (twinning, branch campuses etc.).

Who are the most important persons/units for implementing a strategy for internationalisation your institution?

You may select up to five categories.

- (1) Rector
- (2) Vice-rector
- (3) Dean(s)
- (4) Vice-dean(s)
- (5) Head of International Office
- (6) Staff at International Office
- (7) Administrative staff
- (8) Academic staff
- (9) Students
- (10) Student organisations

What are the most important outcomes of internationalisation?

You may select more than one answer.

- (1) Attracting internationally outstanding researchers
- (2) Attracting more students
- (3) Attracting top-level international students
- (4) Building a diverse student community
- (5) Building a diverse faculty
- (6) Establishing exchange agreements for students
- (7) Strategic partnerships with other universities
- (8) External funding for research and development projects
- (9) Other, please specify: _____

Which activities are part of internationalisation at your institution?

You may select more than one answer.

- (1) Student mobility in/out
- (2) Full degree admission for international students
- (3) Staff mobility in/out
- (4) Incoming guest researchers
- (5) New international staff
- (6) Managing funding schemes and grants
- (7) Erasmus+ programme
- (8) Bilateral agreements
- (9) Coordination of international networks and partnerships
- (10) Advice to the management
- (11) Coordination and planning international meetings and visits
- (12) Other, please specify: _____

Thank you for contributing to the survey. If you have additional comments, please write them below.

Appendix VI. Interview guide for respondents at NORDTEK universities

E-mail and interview guide sent to interviewees before the interview

Thank you for agreeing to participate in a telephone interview. The interview will focus on strategies for internationalisation at Nordic technical universities, and your input will contribute to the information base of my master thesis for the Executive MBA at University of Stavanger. The interview is expected to last 20-30 minutes and will be conducted by telephone, recorded and transcribed after the interview. In the recording, no reference to your name, position or any other personally identifiable background information will be registered.

The questions will concentrate on:

- The institutional motivation for internationalisation
- Implementation of the strategy
- Key components of successful internationalisation

If you have questions about the interview beforehand, please do not hesitate to contact me at katrine.h.kristensen@uis.no.

Interview guide

The institutional motivation for internationalisation

Is there a written strategy and a written action plan for internationalisation at your university?

What is the importance of such written strategy documents?

What are the priorities in the internationalisation strategy?

How is the general support and culture for internationalisation at your university?

What are the main arguments for internationalisation at your university? (see list below, Knight 2008):

- Activity. Internationalisation is described in terms of activities like study abroad, curriculum, academic programs, international students, institutional linkages and networks, development projects, and branch campuses.
- Outcomes. Internationalisation is presented in the form of desired results such as student competencies, increased profile, and more international agreements, partners, or projects.

- Rationales. Internationalisation is described with respect to the primary motivations or rationales driving it. They can include academic standards, income generation, cultural diversity, and student and/or staff development.
- Process. Internationalisation is considered to be a process in which an international dimension is integrated in a sustainable way into the three primary functions of an institution: teaching/learning, research, and service to society.
- Ethos. Internationalisation is interpreted as the creation of a culture or climate on campus that promotes and supports international/intercultural understanding and focuses on campus-based or “at home” activities.
- Abroad/crossborder. Internationalisation is seen as the crossborder delivery of education to other countries through a variety of delivery modes (face to face, distance, e-learning, etc.) and through different administrative arrangements (franchises, twinning, branch campuses, etc.).

What is the role or impact of the (national) government regarding the strategy for internationalisation?

Implementation of the strategy

Can you explain how is the strategy implemented in the organisation?

What is the importance of 1) leadership support, 2) administrative support, 3) faculty / academic staff and 4) students/student organisations for implementation? (Score 1 (low) -5 (high))

What are the main challenges for implementation of the strategy?

How do you work with internationalisation at the institutional, faculty and department level?

How do the leaders of the university communicate internationalisation ambitions?

Key components of successful internationalisation

Are the aims for internationalisation in the strategy embedded in the organisation?

From strategy to practice: How is the strategy embedded in the organisation?

Which factors do you think make the strategy successful (organisation, leadership style)?

Can you give examples of what makes the strategy for internationalisation successful?