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PROGRAM LEADERSHIP FROM A NORDIC PERSPECTIVE - MANAGING EDUCATION DEVELOPMENT

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ABSTRACT

Nordic Five Tech (N5T) is a strategic alliance between five technical universities in Denmark, Finland, Norway and Sweden. The overall aim is to *utilize shared and complementary strengths and create synergy within education, research and innovation*

In this paper we focus on university educational development issues by investigating the program leadership at five Nordic technical universities. Specifically, the paper compares definitions, views and experiences of education leadership in the Nordic Five Tech (N5T) universities. The paper does this by, first, reviewing the definitions of roles and responsibilities for program directors at each university, and second, by presenting results from a survey carried out in March 2012 among program directors at the N5T universities. Based on this data, we analyze how program directors experience their role, their possibilities to lead, and their opportunities of learning to lead. How is time for reflection and development as leaders handled at the different universities? The paper goes on to consider what impact the mandate of the leadership role has on the possibilities for developing educational programs. For instance, how can program directors ensure that learning objectives concerning generic skills and abilities are reached? How can program directors drive implementation of integrative and value-oriented topics such as sustainable development, innovation and entrepreneurship?

KEYWORDS

Education development, leadership, program management, program development, Nordic Five Tech

strategic alliance between five technical universities in Denmark, Finland, Norway and Sweden. The overall aim is to *utilize shared and complementary strengths and create synergy within education, research and innovation*. The collaboration includes the establishment of joint international MSc programs, mutual learning and peer evaluation activities, and network activities to stimulate collaboration in research and education. For example, we have since 2009 run yearly peer evaluation projects for programs. In these, a program director (together with some teachers and students) at one institution shares experiences on program development, with a program director at another institution. The participating programs belong to the same field of study, and the peer feedback has been found to be very relevant and useful [2].

In this paper we focus on educational development issues at our universities from a program leader perspective. We were interested in a deeper analysis and comparison of the program leadership at five Nordic technical universities. What are the educational leaders' (program directors') experience of their function, role and mandate? And how is time for reflection and leaders' own development handled at the different universities?

Specifically, the paper seeks to investigate how definitions, views and experiences of education leadership are described in the Nordic Five Tech universities. We do this by first comparing the definitions of roles and responsibilities for program directors at each university, and, second, by presenting results from a survey carried out in March 2012 among program directors at the N5T universities. With this data, we further analyze and compare how program directors are experiencing their role, their possibilities to lead, and their opportunities for learning how to lead. We also look into the impact this might have on the possibilities for developing educational programs. We consider, for instance, how the program directors can ensure that learning objectives concerning generic skills and abilities are reached, and how program directors can attain implementation of integrative topics such as sustainable development, innovation and entrepreneurship into educational programs.

The remainder of the paper is organized as follows. We first review the literature on educational development with the focus on program leadership. We then outline the research approach of the study and provide the details of the survey, which was the main data collection vehicle of the study. The findings comprise three main sections that review the roles and responsibilities of program directors at the Nordic Five Tech universities, present the quantitative data from the survey, and account for how program directors conduct educational development aiming at integrating innovation and sustainability, respectively. A discussion of the findings wraps up the paper.

WHAT HAS BEEN WRITTEN EARLIER ABOUT PROGRAM LEADERSHIP?

According to Crawley *et al.* [3], program directors play a crucial role in the change of university programs. An important requirement for a successful reform of engineering education is that the reform must be set and maintained at a program or department level. The leaders are in the best position to change a culture, and in the case of university programs, the program directors must lead the change process and, e.g., create a vision for the change. Crawley *et al.* conclude that the commitment and active participation of program directors is vital to accomplish a successful change of university programs. Sheppard *et al.* [4] argue in a similar fashion and suggest that a change of engineering education cannot happen without administrative leadership that is highly supportive and engaged in the endeavour. The engineering faculty is the key actor for a transformation of engineering education, but the engineering faculty needs engagement and support from other actors such as an administrative leadership.

universities in Sweden shows that educational leaders (function, role and mandate) as unclear (Henriksson) that many program directors argue that they lack time for reflection, and possibilities of learning to lead.

Edström [6] claims that the organizational structure of universities is forcing, or rather maintaining, educational programs to a state where they mimic the discipline-oriented, research-based structure of the university organization. This structure leads to major difficulties to run and develop profession-oriented educations where students should reach complex, interdisciplinary, and practice-oriented learning outcomes, and where teaching and learning activities are depending on cooperation between many knowledge fields.

Graham [7] surveyed a large number of education reform projects and concluded that faculty engagement is critical to making educational development happen. However, within Higher Education research is still the foundation for promotion, rankings and evaluation [8], which makes it even harder for program directors to motivate faculty members to engage in educational development and changes processes.

One part of program development is active gathering of feedback from relevant actors. A study by Kinnunen [9] carried out at Aalto University in the context of computing education, revealed that even though gathering feedback from students is a standard practice, only some informal and anecdotal information is available from teachers. There is no kind of formal process of gathering feedback from teachers. This, however, would be highly relevant from a program development point of view,

Specifically within engineering education, the implementation of the Bologna agreement has introduced further complexity to the tasks of program directors: In many countries, including Sweden and Finland, the traditional five-year MScEng programs have continued also after a 3+2 model for higher education has been introduced. Then, a program director might become responsible not just for one program, but for an entire portfolio of programs: a 3-year program that leads to a bachelor's degree, a set of 2-year master programs, a five-year program which is comprised of a bachelor and a master program. One example of the difficulties that arise because of the 3+2 year division, when one MScEng program may be linked to ten or more master programs, is that it has become harder to align the progression between first cycle level and second cycle level regarding the CDIO learning outcomes (e.g., oral and written communication, teamwork, project methodology).

In summary, program directors face a number of difficulties and need to overcome these in order to design good programs and to effectively operate them. In the paper, we are searching for effective practices that are applied by program directors. In particular, we are investigating differences between program directors that are happy with their role and those who are not. The basic rationale for this approach is that a study of happy program directors may lead to the identification of effective practices, while, on the other hand, the study of unhappy program directors may help identify problematic aspects of the assignment that should be counteracted by the university.

RESEARCH APPROACH

The research questions of the study focused on the N5T program directors' experiences of their role, working tasks and possibilities to implement change in their study programs.

The research approach comprised two main data collection activities. First, documents describing directors' roles and responsibilities at the universities were collected. Second, a questionnaire was then sent to all program directors at the five universities, via e-mail.

and questions give us the possibilities to separate from (a) the five different universities, (b) the different directors are leaders for, and (c) the number of years of experience the different program directors have.

The questionnaire mainly consists of quantitative questions. The respondents are asked to rate different statements on a scale from 1-5 (or from *not at all* to *very much*). Statements 4.1-4.10 pose statements concerning the program directors' views on the *current state, definitions and structure*. Statements 5.1-5.8 concern *support and possibilities to influence courses and teachers* in the program. Finally, the statements 6.1-6.9 concern *networking, dialogue with management and being able to learn how to lead*. The last survey question is a qualitative question formulated as a case, asking for the strategies the program directors apply, when faced with issues closely related to the CDIO vision.

See the complete questionnaire in Appendix 1.

FINDINGS

The section presents the findings of the study. First, the roles and responsibilities of program directors at each of the Nordic Five Tech universities are reviewed. We then present the quantitative data from the program director survey; finally, free text responses on the program director's ability to drive educational development are discussed. The data is compared in two ways: first across universities, and then across the categories 'unhappy' and 'happy' program directors.

Definitions of roles and responsibilities of program directors at the Nordic Five Tech universities

Aalto University

At Aalto University each program is associated with one of the six schools, though generally other schools give some courses or modules in the program as well. There are three types of programs: 5-year programs leading to Master's degree, 3-year programs leading to Bachelor's degree, and 2-year international Master's programs which require Bachelor's degree as an entry requirement. All 3-year programs are considered as the first part of the corresponding 5-year program. Moreover, each Master's program is associated with some of the 5-year programs.

The 5-year program director coordinates also the corresponding Bachelor's program, which has no director of its own. Master's programs have their own directors. However, the 5-year program director nominally coordinates also them, as a whole, as the status of Master's program director is more like a professor who is in charge of a major in the 5-year program.

The main task of the (5-year) program director is leading the development and implementation actions of the program according to the defined program goals. He/she leads the program council, in which most of these actions are prepared. The council has professor, teacher and student representatives from the program. In addition, the director supervises tutoring actions and study planning activities, and represents the program externally. The school provides some small funding for the development actions; in general, the funding resources are distributed from the school to departments. Heads of departments makes decisions on educational resources, not program directors. The tasks of a Master's program director are not formally defined in details: the director is responsible for the scientific and educational quality of the program.

Education support unit organizes, in addition to normal educational leadership, in which the program directors may participate in some systematic training for program directors, nor regular forums for sharing experiences, though different schools can take independent actions here.

There is no common standard for how much working time is allocated for the program directorship tasks.

Chalmers University of Technology

The program directors at Chalmers take responsibility for a study program as a whole. This means that a program director is responsible for developing, planning, and assuring the quality of a study program. One specific task is to develop and maintain a program description, which is the main documentation of the program, including learning outcomes for the whole program and a specification of the curriculum. The program director further conducts annual evaluations of the courses and programs. Based on the evaluation, change needs are identified and agreed on with the department that teaches the course. Finally, the program directors are responsible for leading the team of teachers that teach in the program.

The program directors are supported by a program team, which includes student counsellors and administrative staff. Students are continually involved in program development and quality assurance. Each study program also has an advisory board for that gives advice on the aims and content of the program and which includes representatives from industry, faculty and students. The study programs at Chalmers are divided into four schools. The program directors in each school form a group that meets frequently, typically bi-weekly, to discuss different topics and to share experiences.

The assignments are for three years at a time and usually for 30 % (Master's program directors 20 %). The rest of their time, the program directors take part in the research and education in a department. There is some variance in the tasks of program directors depending on type of study program. For example, the directors of Master's programs have less authorities and obligations since the two-year Master's programs are organized as parts of the five-year MScEng and MArch programs, which have their own program directors.

Technical University of Denmark (DTU)

At DTU, program director assignment descriptions summarize the tasks and obligations of the program directors in relatively general terms. The tasks of a program director at DTU include coordinating the program, evaluating and developing the program, counselling of students etc. The role of the program director is complicated by the fact that department study boards are responsible for the individual courses, including evaluation and development of the individual course. Programs normally consist of courses from up to eight departments meaning that program directors must negotiate, e.g., course content and learning objectives, with many different stakeholders.

Meetings lead by the deans with BEng, BSc and MSc program directors are held regularly. From time to time seminars for program directors are held, e.g. as a 24 hours seminar (residential courses, lunch to lunch) where all program directors meet and discuss matters related to their function as program directors. The relevant dean participates.

There is a course for program directors offered by LearningLab DTU. It consists of three modules. Module 1 addresses the role of the program director at DTU, module 2 addresses program leadership (and the distinctive situation where they shall perform leadership without really having the power to lead), and module 3 addresses quality in teaching and learning

changes (for the deans) the deans' teaching seminar. Others are invited. There are different themes on the addresses how we meet the new students and how we explicitly and implicitly form the students (the implicit student).

The Royal Institute of Technology (KTH)

The program directors at KTH have the responsibility for the program as a whole and are supported by both a program board and by administrative staff. He/she reports to the Director of Undergraduate and Masters' studies at the school where the program belongs.

Typical responsibilities of the program directors include design of the study program's curriculum, time table coordination, rules for admission to, and selection of students to, the program, quality assurance and continuous improvement by follow-up of course analyses, surveys, examination and student retention. KTH program directors have an economic responsibility for program resources. They are active in national and international student recruitment, reception, information and exchange planning. Program directors together with the administrative staff conduct student recruitment activities such as participation at national and international educational fairs, as well as student counselling.

A typical assignment is for 20-30 %. The rest of the time the program directors do research and teach.

All study programs at KTH have recently (2011) gone through a major evaluation process [10]. This quality assurance and education development project, EAE (Education Assessment Exercise) involved international evaluators with site visits and interviews. One of the major findings was that program leadership needed to be strengthened at KTH. A working group was assigned during Fall 2011, with a mission to clarify the roles and responsibilities of the program directors, as well as to give input to suggestions on improvements. Their report is presently under discussion, and possibly decisions will be made in May 2012. There is a strong awareness at KTH that as a program director you often lack tools to monitor students' progress towards learning outcomes, as well as tools to develop and improve the education from a program perspective.

The Norwegian University of Science and Technology (NTNU)

At NTNU, there is no formal role description for program directors. Also, there are no formal structures for securing resources to program directors (or study programs). Since the 17 five-year and numerous two-year engineering programs are also spread between four faculties and more than 20 departments, this means that program managers at NTNU are a diverse lot short on formal power and resources. Depending on circumstances and history of their programs, they can, however, be very important people when it comes to deciding the course structures and learning outcomes of their study programs, and they can also have a vast number of informal resources linked to their programs.

Some program directors combine this role with the role of head of department, or they could be the vice head of studies of a department, but most of them are assigned such a position by line managers. They usually have some form of administrative support from their department or host faculty, and some study programs have their own advisory board.

The program director is usually responsible for suggesting the study plan for the program, as well as proposing suitable learning outcomes. He or she needs to bargain with the department(s) regarding courses to be offered into the program, or in some cases courses made specifically for the program, but the department holds all the official resources for

Program director also has a responsibility for the quality of the study program. Program directors are also involved in student recruitment and student facilities are present (reading rooms, group rooms, laboratories and computer labs). Finally, program directors often are called upon to motivate and lead the faculty members teaching in the study program.

The role of the program director has been in focus since 2009, and there is now an ongoing discussion at the university of the role and responsibilities of a program director. This means that a lot of development will happen in this role in the years to come.

Discussion

The program director's main tasks in the Nordic Five Tech universities are fairly close to each other, including coordinating the development of the program and associated other programs as a whole. The provided support, on the other hand, varies considerably. At DTU and Chalmers there are regular forums for getting support from peers, whereas Aalto directors are working more alone. Chalmers also reports that program directors are allocated considerably working time, whereas at Aalto, for example, the time needs to be negotiated with the department head or dean individually. KTH is currently in a transformation phase, and new practices are just being designed. There is also variation in the emphasis of the role as leaning towards being a "leader" or a "manager". Chalmers aims to strengthen the program directors as leaders by bringing forward such dimensions in the role description and by shifting some responsibilities to administrative staff. Program directors at KTH assume both a leading and a managing role.

Response rate

Let us now discuss the findings from the survey. 88 program directors at the Nordic Five Tech universities responded to the questionnaire. In Table 1, the response rate is related to the number of study programs, and number of program directors at each university.

Some program directors have multiple affiliations: one works at both NTNU and Chalmers, one works at both NTNU and DTU and finally, one works at both Chalmers and DTU. We note that as the response rates from Aalto, KTH and NTNU are very low, the following quantitative results concerning them should be considered with care. There could be bias that only the most active program directors have responded to the questionnaire.

Table 1.
Survey response rate

	# 1 st cycle 3-year programs (# respondents)	# 5-year engineering/ architecture programs (# respondents)	# 2 nd cycle 2-year master programs (# respondents)	Total # of program directors	Total # of responses
Aalto	19 (1)	19 (1)	35 (5)	54	6
Chalmers	12 (6)	15 (5)	41 (14)	68	23
DTU	15 (13)	(0)	28 (16)	42	28
KTH	18 (5)	19 (4)	87 (16)	101	22
NTNU	0 (0)	17 (5)	42 (7)	27	11
Total	115 (25)	79 (15)	309 (58)	358	88

Comparison across universities

We start the discussion of the survey results by considering some similarities and differences that were found in the survey responses from program directors at the five universities.

Ratings of statements 4.1-4.10 concerning current state, definitions and structure

The ratings of statements 4.1 - 4.5 (see Appendix 1) reveal some differences between the universities. Aalto and DTU gave 4.0 and 3.7 respectively to having clearly defined working tasks (statement 4.1), where the lowest, 2.8 and 2.9, were recorded at KTH and NTNU. For statement 4.2, Aalto and DTU again are on the top, giving the score 3.7 and 3.4 respectively to how well defined mandate a program director has, where NTNU, Chalmers and KTH all rate this with 2.6. How well the time to spend on program directorship tasks is stated, is rated highest by DTU (3.3), and the lowest by Aalto, KTH and NTNU (2.0, 2.1, 2.1). The pedagogical/educational development training courses seem most relevant at DTU (3.3), and least relevant at NTNU (2.1). When needing to solve urgent situations, Aalto program directors seem to feel best equipped (3.7), while NTNU and KTH rate this lower (2.0 and 2.2 respectively).

At all universities responding program directors have a clear vision of how their program should ideally be composed, and of how the program is composed today. The need for improvement of the current quality assurance system (statement 4.8) is rated highest by program directors at KTH (3.5), and the lowest by Aalto and DTU (2.5 and 2.6). Teachers' subject knowledge, competence, values and attitudes (statements 4.9 and 4.10) are not identified by any of the universities as in need for improvement.

Ratings of statements 5.1-5.8 concerning support and possibilities to influence courses and teachers in the program

When it comes to being able to influence the competencies of the teachers in the program, all rate 2.3 or lower, except Aalto (3.2). The possibility to influence the learning objectives and activities in a single course is also rated highest, but not especially high, by Aalto (3.0 on both). The possibility to influence assessment tasks in single courses is rated low by all, with NTNU having the lowest rating score (2.0). Being able to influence how course evaluations in single courses are designed is rated highest by NTNU (3.2), and lowest by DTU and Aalto (2.4 and 2.5).

Administrative support (statement 5.6) for program directors has a high rating at Aalto (4.3), and rather low ratings at the other universities (2.5-2.8). A similar pattern is shown when looking at support from a program council (or the alike statement 5.7), where Aalto gives the rate 4.0, and KTH the lowest (2.6). Having enough time for the program director task (statement 5.8) is rated quite low at all universities, though with some differences, where NTNU rates this with 1.7 and Aalto with 2.7.

Ratings of statements 6.1-6.9 concerning networking, dialogue with management, and being able to learn how to lead

The program directors at Aalto, DTU and Chalmers seem to network sufficiently with other program directors at their university (3.5, 3.5 and 3.2), while KTH program directors rate this with 2.5 (statement 6.1). Networking with program directors at other universities (statement 6.2) does not seem very common at any of the universities.

The possibility to learn how to lead a study program (statement 6.4) is rated highest by Aalto (3.5), where the others rate this quite low (2.3-2.6). Aalto gives the lowest rating (1.3) to

inferences - which is slightly higher rated at Chalmers

The dialogue between higher education management and program directors on education quality issues (statement 6.7), is rated to be most effective at DTU (4.0), and least effective at KTH (2.2). KTH and Chalmers rate low on the possibility to as a program director strengthen his/her mandate, role and function (statement 6.8) in dialogue with education management (2.4 and 2.5), and again DTU gives the highest rate (3.2), this time closely followed by NTNU (3.1).

Responses to question 7: Strategies for improving the integration of innovation or sustainable development into the program

The typical solution in this case seems to be to work with existing courses and integrate the new aspects or competencies here. One of the program directors argues:

As this kind of subjects are about applying general technical knowledge in a specific situation or context, I would as much as possible integrate it in the courses where these issues belong. Sustainable development for instance in the process of choice of material and manufacturing method. Innovation in specific project courses.

Some respondents elaborate on creating a new course for this purpose, and a few mention that they have already done so. The creation of a new course is argued by some to be a solution when integration in existing courses is not possible to carry out, and by some even to be preferable since it signals the high importance of the new aspects or competencies.

A variety of strategies to reach a solution are outlined, in order. Some program directors work mostly individually with key program director tasks such as drafting new program objectives, identifying appropriate courses to work with, and coaching teachers. Others describe strategies that already in an early stage involve teamwork among teachers, not always including the program director himself/herself.

Aalto

There are five responses to this question from Aalto. Even though Aalto's program directors have shown the highest scores for having tools when issues arise, for being satisfied with how learning objectives are implemented, and for having possibilities to influence objectives and activities in courses, this is not easily traced in the solutions to this case.

On the BSc level, I would talk with the teachers of some individual courses about integrating innovation or sustainable development issues into their courses. Discussion in the program council and with other professors would be required to determine whether these topics should be included in the studies of all students or into some elective course or module. On the MSc level, I would talk with the professors responsible for different major subjects. It is up to them to decide whether to adopt such proposals.

I would contact the program professors to discuss and decide how this feature could be implemented into some of the courses in the program or if we should have a separate course for the topic. Probably I would recommend integration. But I am not in a position to "tell" other professors to change their courses. In the case there would be no voluntary changes, I would go to the dean to discuss the issue and possibly get more leverage.

There are no normal steps. I would have to invent them as I go.

program directors who answered this question describe a general roadmap or some kind of project plan for the task, with steps to take for a team. This can look like:

1. *Identify the need and get support from the council.*
2. *Set aside some money in the budget for the project.*
3. *Offer the relevant departments to take part in the project by assigning the teachers in the relevant courses to the project and maybe someone else.*
4. *Form a project group with the teachers assigned by the departments and maybe some students and some external experts. In some cases I would join the team myself.*
5. *Get the project running by gathering the project group, tell them about the needs, the goals of the project and inspire them to do their best, and start brainstorming.*
6. *Have the project group report at some different stages and in the end they should come up with a course design that could be implemented the year after.*

DTU

The 22 answers from DTU signal optimism. There seem to be tools at hand, in order to make decisions about the program, though by the program director himself, but places where the program directors can turn to.

First, I would discuss it with the study board. If the topic is large enough to warrant a dedicated course, then I first would identify the right person to be in charge of such a course. It would be a challenge to free the resources, but if successful, I would design the course in dialogue with the responsible teacher. This has not been a problem in the past. If the topic requires implementation in existing courses, then I would first identify the relevant courses and enter a dialogue with the responsible teacher(s). I haven't had any problem with this in the past.

If the new topic could be incorporated into existing courses, I would first open a dialogue with the relevant faculty members to discuss, how the new topic could be added to one or more relevant course. If not (or if there's not any course where the new topic could fit in), I would bring the matter to the department's study board, which has the authority to create and/or modify courses. In the unlikely event that this is also not possible, I would discuss the matter with the department management, to ensure that resources are allocated to bring the new topic into the curriculum.

There are also some less optimistic responses from DTU:

It is actually rather hard with these things, I have tried with sustainable development but the teachers are very stressed and have no time.

If the first approach fails, I can either go up (to the dean or heads of study boards) or down to the lecturers in particular courses. I've tried the latter in a single case - it was a steeeeeep hill and it failed - but I have reason to believe that there is hope in a few years...

KTH

At KTH, like at Chalmers, there are five program directors who describe a structured process with a clear path from start to finish. Some make substantial personal contributions to such a project:

- relationship between this new aspect, and the core to assess what character of role it might play -- what "kind" of program learning outcome might be appropriate.
2. Then I'd write a new goal pertaining to the aspect, in a way that is appropriate to our discipline and useful for program management.
 3. After that, I'd assess in what ways that new goal is already addressed in courses.
 4. (If necessary) I'd identify courses that best suitable candidates to incorporate the new aspect, and contact the teacher to discuss and agree on how to implement it in the course goals, as well as provide suggestions for activities and assessment.
 5. I'd let the adjusted course run, and later check the overall results in terms of exam results and student evaluations (not just of that aspect, but all aspects).

Others gather up a team:

1. Try to collect a group for defining the task.
2. Take a look at the current courses to find out how/if it is possible to implement the task. Perhaps it is there but not visible.
3. Contact the course responsible teachers for a discussion.
4. Implement the task, make it visible in learning objectives and assessment.

NTNU

At NTNU there are five responses to this question. It seems to be common to raise this type of issue in a program council, and get the discussions going from there. None of the program directors at NTNU describe any kind of a pre-defined project model with teamwork among teachers to reach a common solution. The mandate for the program director, and tools to use, are lacking:

1. I bring it up for the study program council to brainstorm around the topic, and identify courses where this is already a natural part or where it may fit in.
2. Meet with the department manager who has the personnel responsibility and with individual teachers who would be positive to the idea.
3. Hope for volunteers.

The study program director does not have any "power", neither to allocate human nor financial resources, and can therefore only hope for the best.

Results from questionnaire II: Happy and unhappy program directors

In the following, we shift focus from comparing across universities to comparing two specific groups of program directors, namely those that are happy with their assignment, and those that are not.

In the survey, statement 6.8 I am happy with my work as a program director could be rated from 1-5, where 1 = not at all and 5 = very much. There are 12 program directors who rated this question with 1 or 2 out of 5. 43 rated 4 or 5 on this question. See Table 2. In the following, we will compare these two groups of the unhappy and happy program directors.

When comparing the five universities' program directors' ratings, the program directors at Aalto seem the most happy with their work as program directors (4.2) and NTNU the least happy (2.9). Around 50 % of the program directors at DTU, Chalmers and KTH, rate this statement with 4 or 5, and a slightly higher percentage at Aalto. The number is lower at NTNU. However, NTNU's number of respondents is also lower.

Table 2.
happy program directors at each university

University	Number who rated 1 or 2 (low on happiness) (# program directors answering the survey)	Number who rated 4 or 5 (high on happiness) (# program directors answering the survey)
Aalto	1 (6)	4 (6)
Chalmers	2 (23)	11 (23)
DTU	4 (28)	15 (28)
KTH	1 (22)	10 (22)
NTNU	4 (11)	3 (11)

These two groups of program directors have about the same distribution on types of study programs that they lead and years of experience, with one exception. In the group of happy program directors there is a larger fraction who have worked as directors for more than five years (53.4 % compared to 37.4 % in the whole group).

Ratings of 4.1 i 4.10 (current state, definition and structure) among unhappy and happy program directors, respectively

When we compared the two groups $\bar{r}_{unhappy}$ and $\bar{r}_{happy}$ we noticed that the ratings they gave to some of the statements were quite different, as evident from Table 3. This pertains first to how the program directors find their role, time and mandate *defined*. There is a clear difference (0.8-1.0 units) in rating between happy and unhappy program directors with respect to mandate and task definition, further brought home by the dissatisfaction the unhappy program directors express with respect to available means to address problematic issues. The unsatisfied program directors find the pedagogical training offered less relevant and they do not find themselves as well equipped to re-solve urgent situations. Both groups rate quite equally on the clarity of their vision of their program, and on how the learning objectives are implemented, although the more satisfied program directors rate a bit higher on these two statements. When it comes to the existing quality assurance system of the program, both groups rate quite similarly on how much it needs to be improved (3.1 and 2.8), and none of the groups rate highly that teachers's knowledge nor attitudes need to be improved.

Ratings of 5.1 i 5.8 (support and possibilities to influence courses and teachers) among unhappy and happy program directors, respectively

In Table 4 responses about possibilities to influence and make changes in the program are shown. Both groups rate quite low on their possibilities to influence the competencies of the teachers in the program, and also low on the possibilities to influence the assessment tasks in single courses/modules. Having enough time for the program director assignment is also rated low by both groups, although one can see that this statement is rated significantly lower by the unhappy program directors. This group also rates lower on possibilities to influence the learning objectives of single courses and the students's course evaluations. It is also clear that support for the program director, both from administration and from a program council (or similar) is higher rated among the happy program directors.

Table 3.
Survey responses for unhappy and happy program directors (PD)
concerning their roles and mandates

	Situation statements	Unhappy PDs	Happy PDs
4.1	My working tasks as a program director are clearly defined	2.7	3.5
4.2	The mandate I have as a program director in order to develop the study program I lead, is clearly defined	2.3	3.3
4.3	The time to spend on program leadership tasks are clearly stated	2.1	3.0
4.4	The pedagogical/educational development training courses offered at my home university are relevant to me as a program director	2.2	3.0
4.4	When an urgent issue/situation arises with the study program, I have methods/tools/plans at hand to use in order to work with the situation	1.9	2.9
4.6	I have a clear vision of how the learning objectives of the whole study program (knowledge, skills, abilities, competencies) should be implemented and trained throughout the study program	3.5	3.9
4.7	I am satisfied with how the learning objectives of the study program are implemented and trained throughout the study program	3.3	3.6
4.8	The quality assurance system of the program I lead needs to be improved	3.1	2.8
4.9	Teachers'/Faculty's knowledge and competence in education and/or quality assurance, within my program, needs to be improved	2.7	2.5
4.10	The attitudes and values concerning education and/or quality assurance among teachers/faculty within my program needs to be improved	2.9	2.6

Table 4.
Survey responses for unhappy and happy program directors (PD) concerning
their possibilities to influence

	Statements on possibilities to influence	Unhappy PDs	Happy PDs
5.1	I have the possibility to influence the competencies of the teachers in the study program	2.4	2.2
5.2	I have the possibility to influence the learning objectives of single courses/ modules in the study program	2.3	3.0
5.3	I have the possibility to influence the learning activities in single courses/ modules in the study program	2.4	2.8
5.4	I have the possibility to influence the assessment tasks in single courses/ modules in the study program	2.5	2.6
5.5	I have the possibility to influence the way in which students can evaluate single courses/modules in the study program	2.2	2.8
5.6	I have enough administrative support to accomplish my tasks as a program director	2.0	3.0
5.7	I have enough support from a program council (or the alike) to perform tasks as a program director	2.0	3.3
5.8	I have enough time to work as a program director	1.3	2.3

Ratings of 6.1 i 6.9 (networking and developing as a leader) among unhappy and happy program directors, respectively

When comparing the two groups, we further find that there seems to be less networking with other program directors, both within and outside the home university, among the less happy program directors. The possibilities for learning to how lead a study program is equally rated (2.7 and 2.8), and attendance at pedagogical conferences is rated low in both groups (2.0 and 2.1). The dialogue between program directors and higher education management seem to work satisfactorily in both groups (rated 3.1 in both groups). Finally, the unhappy program directors rate their possibility to improve their mandate, role and function in dialogue with education management lower (2.6 compared with 3.0). See Table 5.

Table 5.
Survey responses for unhappy and happy program directors (PD) concerning
networking and development as a leader.

	Statements on networking and development as a leader	Unhappy PDs	Happy PDs
6.1	I network with other program directors at my university	2.6	3.4
6.2	I network with program directors at other universities	1.4	2.3
6.3	I would like to have more possibilities for networking on a national/international level with program management/development issues	3.2	2.9
6.4	I have the possibility to learn how to lead a study program	2.7	2.8
6.5	I have the possibility to reflect upon my leadership	3.0	2.9
6.6	I have attended national/international pedagogic conferences	2.0	2.1
6.7	There is an effective dialogue at my university between higher education management and program directors in order to maintain/improve high quality in education programs	3.1	3.1
6.8	I have the possibility to improve my mandate, role and function in dialogue with education management at my university	2.6	3.0

Strategies for the case outlined in question nr 7 among happy and unhappy program directors, respectively

When comparing the strategies that the unhappy and the happy program directors outline to the case question included in the survey, we find that program directors from both groups identify three main paths: to create a new mandatory course, to integrate the delivery of the new program learning objective in existing courses, or doing both.

The strategies seem to involve more organized teamwork where teachers, students and industry partners are involved among the more happy program directors, 6 out of 29 respondents outline a structured process, where relevant groups contribute, from discussion, through a project, to implementation, for example:

1. *I would identify the need and get support from the council.*
2. *Set aside some money in the budget for the project.*
3. *Offer the relevant departments to take part in the project by assigning the teachers in the relevant courses to the project and maybe someone else.*

teachers assigned by the departments and maybe external experts. In some cases I would join the team

5. Get the project running by gathering the project group, tell them about the needs, the goals of the project and inspire them to do their best, and start brainstorming.
6. Have the project group report at some different stages and in the end they should come up with a course design that could be implemented the year after.ð

8 others, out of the 29 who responded to the case question, also describe structured strategies and plans, but apply a more individual approach to get through the system:

I would make a concrete proposal, discuss it with colleagues which would be involved or affected by it (e.g. teachers in individual courses), and then approach faculty representatives and management at higher levels within my university until those who can make actual decisions regarding an implementation are able to assess the proposal. I believe I have enough contacts and knowledge about how my university works both formally and informally in such matters, but it may take time depending on how controversial a proposal of this type is considered.ð

These variants of structured educational development processes cannot be found among the unhappy program directors who have the experience that is the program director's job and try to convince others to join. Even if they do open up for a dialogue, no outline is sketched on what happens after the discussion:

Find out how others have done. Have a dialogue with the team of teachers in the program if teachers responsible for different courses. Discuss how this issue/aspect could be integrated.ð

1. *Bring it up for the study program council to brainstorm around the topic, and identify courses where this is already a natural part or where it may fit in.*
2. *Meet with the department manager who has the personnel responsibility and with individual teachers who would be positive to the idea.*
3. *Hope for volunteersé*
4. *The study program director does not have any powerð neither to allocate human nor financial resources, and can therefore only hope for the best.ð*

DISCUSSION

The present study is the result of a survey addressing the different functions, work tasks, and mandates of the role of program director at the five universities. The evaluation of the study is ongoing work and here only some preliminary results are presented.

Four tables summarizing the answers of the participating program directors indicate some interesting differences. As has been noted the results need to be carefully considered. Only a limited number of the program directors at the different universities have answered the survey, especially from Aalto, KTH and NTNU. Still, we believe the survey to be of real value for further work. Table 2 shows how many of the program directors that are satisfied with their work situations as program directors, filtered with respect to university. The table clearly shows that the number of program directors who are happy outnumber those who are not. However, there is also a considerable fraction of unhappy program directors.

The following three tables, Table 3-5, show what the differences between these two groups of program directors are with respect to specific statements. For some statements, there is no significant difference between those who rated low and those who rated high on



Interest are specific statements where the opinions differ. The definition, available means to address problematic issues, support from administrative staff and a program council, the time allocated for program leadership and the extent of networking with other program directors at the home university and at other universities. All of these issues could be counteracted by strategic work on the program director function, and N5T could play an important role to support in this development both by disseminating effective practices found within the alliance and by facilitating networking among program directors.

Filtering the answers with respect to, e.g., degree of happiness with their work is a fruitful way to identify questions that need to be followed up. Another possibility is to filter with respect to length of experience, where preliminary results indicate that there is a clear difference between program directors with 1-2 years of experience, and those with 5 or more years of experience in how they appreciate tasks and mandates.

To summarize, we believe that it is very useful to make a closer study of the roles, functions and mandates of the program directors who at all Nordic Five Tech universities are of central importance in the development of curricula and pedagogic approaches for the programs. The present paper illustrates how questions can be designed and answers filtrated to identify areas for further research. In the next phase, a thorough analysis of the answers will be followed up by further examination of differences in organization between the universities, and a deeper investigation of how the program directors conduct their work will be undertaken.

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1. Which N5T university/institution do you work for?

☐	Aalto
☐	Chalmers
☐	DTU
☐	KTH
☐	NTNU

2. Which type(s) of study program(s) are you a director/manager/leader for?

☐	First level/cycle 3 years bachelor program (technical/engineering/architecture)
☐	5 years engineering/technical/architecture program
☐	Second level/cycle master 2 years program (technical/engineering/architecture)
☐	Other

3. How long experience do you have with leading a study program?

☐	Less than 6 months
☐	6 months - 1 year
☐	1-2 years
☐	2-5 years
☐	5-7 years
☐	More than 7 years

4. Rate the following items, from "not at all" to "very much"

	Situation statements	Not at all	A little	Pretty well	Well	Very much
4.1	My working tasks as a program leader are clearly defined	☐	☐	☐	☐	☐
4.2	The mandate I have as a program director in order to develop the study program I lead, is clearly defined	☐	☐	☐	☐	☐
4.3	The time to spend on program leadership tasks are clearly stated	☐	☐	☐	☐	☐
4.4	The pedagogical/educational development training courses offered at my home university are relevant to me as a program director	☐	☐	☐	☐	☐
4.5	When an urgent issue/situation arises with the study program, I have methods/tools/plans at hand to use in order to work with the situation	☐	☐	☐	☐	☐
4.6	I have a clear vision of how the learning objectives of the whole study program (knowledge, skills, abilities, competencies) should be implemented and trained throughout the study program	☐	☐	☐	☐	☐
4.7	I am satisfied with how the learning objectives of the study program are implemented and trained throughout the study program	☐	☐	☐	☐	☐
4.8	The quality assurance system of the program I lead needs to be improved	☐	☐	☐	☐	☐
4.9	Teachers'/Faculty's subject knowledge and competence in education and/or quality assurance, within my program, needs to be improved	☐	☐	☐	☐	☐
4.10	The attitudes and values concerning education and/or quality assurance among teachers/faculty within my program needs to be improved	☐	☐	☐	☐	☐

from "not at all satisfactory" to "very much

	Possibility to influence	Not at all satisfactory	A little satisfactory	Pretty satisfactory	Much satisfactory	Very much satisfactory
5.1	I have the possibility to influence the competencies of the teachers in the program					
5.2	I have the possibility to influence the learning objectives of single courses/modules in the program					
5.3	I have the possibility to influence the learning activities in single courses/modules in the program					
5.4	I have the possibility to influence the assessment tasks in single courses/modules in the program					
5.5	I have the possibility to influence the way in which students can evaluate single courses/modules in the program					
5.6	I have enough administrative support to accomplish my tasks as a program leader					
5.7	I have enough support from a program council (or the alike) to perform tasks as a program leader					
5.8	I have enough time to work as a program leader					

6. Rate the following items, from "not at all" to "very much"

	Networking and developing as a leader	Not at all	A little	Pretty much	Much	Very much
6.1	I network with other program directors at my university					
6.2	I network with program directors at other universities					
6.3	I would like to have more possibilities for networking on a national/international level with program management/development issues					
6.4	I have the possibility to learn how to lead a study program					
6.5	I have the possibility to reflect upon my leadership					
6.6	I have attended national/international pedagogic conferences					
6.7	There is an effective dialogue at my university between higher education management and program directors in order to maintain/improve high quality in education programs					
6.8	I have the possibility to improve my mandate, role and function in dialogue with education management at my university					
6.9	I am happy with my work as a program leader					

7. Case: Let's say you were about to improve the integration of for instance innovation or sustainable development (or some other aspect, competence or perspective that is not the main subject, but asked for by future employers) in the study program you lead.

Please provide a short description of the strategies you have for this situation. What are the normal steps you would take? What options would you like to have?