PROGRAM ADVISORY BOARDS IN ENGINEERING EDUCATION – INDUSTRY REPRESENTATIVES AND THEIR CONTRIBUTIONS TO PROGRAM DEVELOPMENT

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Abstract

Study programs in higher education institutions (HEI) should be developed in line with society, which is challenging with the increased speed of technical development. To ensure alignment many academic institutions use advisory boards on college, school, or department levels. Some HEI have advisory boards on program level, containing of stakeholders that represent a variety of interests; practitioners from industry, teachers from academia, students and program management. There are studies that indicate that advisory boards have a certain influence on program development. However, there are other studies that show that advisory boards are not as effective as desired and expected. Although this field has been studied several times, mainly through questionnaires, research has not given answers to the question on how industry representatives contributes to program development.

In this study, we explore the field of program advisory boards (PAB) for individual engineering study programs (BEng and MEng) through interviews with heads of program at one technical university in Sweden. The purpose is to better understand how these boards operate and how industry representatives contribute to development of study programs.

The PABs’ main purpose is to advise heads of program on strategic level program development.

Results of this study show that board members’ possibilities to contribute to program development varies due to imprecise formulations in steering documents on how PAB’s should be put together and how they should operate. Their possibilities to contribute also depend on the current development speed of the program (steady-state or more radical development), and to what extend the head of program perceive a need for advice on program development issues.

Further results show that PAB meetings include informative topics, which generally occupies a large part of each meeting. This leads to a limitation of more strategic discussions where industry representatives can contribute, and thus influence program development.

Heads of program still claim that advisory board meetings create a desired legitimacy for program development activities. However, they also express that the possibilities to execute any changes based on the industry representatives’ contributions are limited due to the HEI’s governance structure.

Keywords: Advisory Board, Higher Education, Engineering Education, Curriculum Development, Program Design, University-Industry Cooperation.

1 INTRODUCTION

Within higher education it is important that the content of education meets existing and future competence needs of industry [1], as well as the study program being attractive to potential and current students. When developing study programs and courses, it is therefore important from a strategic as well as from an operational perspective that teachers and program gain understanding of the needs of the labour market.

Labour market’s needs can be understood through different types of contacts between higher education institutes (HEI), i.e. those who develop study programs and industry representatives. One common way is to involve industry representatives in different forums and decision-making bodies linked to the study programs.

One such forum is the program advisory board (PAB), where industry representatives from program-relevant companies and organisations can contribute with experience, viewpoints and knowledge together with teachers, students and program management from the university. During 2017 and 2018 one project aiming at creating effective PABs has been run at Chalmers University of Technology. The results from this project is yet to be evaluated.
Previous studies within the field of industry contribution to university study programs are limited. Genheimer and Shahab [2, 3] have published results from a survey-based study in which school directors and advisory board members at 90 USA based engineering educations were asked about PAB work and efficiency. A large part of these studies covers school and program financing with no relevance to Swedish context. Viswanathan [4] claims PABs significance in program development based on a study at National University of Singapore. Emmer and Abdallah Ghanem [5] present results from an USA-based survey, industry representatives were asked about PABs impact on development of construction management program curriculum. El Refae, Askari and Alnaji [6] report results of a small survey at a university in the United Arab Emirates, based on questionnaires about program advisory boards’ impact on quality of education. All previous studies are based on questionnaires with quantitative research approaches.

The aim of this study is: How do industry representatives contribute to program advisory boards and program development, from program management perspective?

2 METHODOLOGY

Based on the desire to increase understanding of how the industry representatives contribute to program development, an exploratory research strategy, in line with Bryman and Bell [7], and qualitative method has been applied.

In previous studies within the field of PABs work and cooperation with industry [2, 3], questionnaires have been the main source of data. In this study, these questionnaires have been modified to fit the interview format. The modifying interview template was tested by conducting a test interview, after which minor adjustments were made.

In order to fulfill our aim and better understand differences in approach and cooperation within the PAB, interviews were carried out. The selection of interviewees was then made through a quota selection [8] among the heads of program at Chalmers University of Technology. The various quota groups: (1) Architecture and Urban Design, (2) Mechanical engineering, mechatronics and automation, design as well as shipping and marine engineering, (3) Electrical Engineering, Computer Technology, IT and Industrial Engineering and Management, and (4) Physics, Chemistry and Bioengineering, as well as Mathematics and Engineering Preparatory Year. Program level were both at Master of Science in Engineering and Bachelor of Science in Engineering programs.

Eleven semi-structured interviews were carried out. Every interview had a time frame of 45 to 90 minutes, and notes were taken by the interviewer. The interviews were recorded and transcribed before analysed by both authors.

3 RESULTS

Four areas related to the industry representatives' prerequisites are presented in this chapter: (3.1) The aim and tasks of the PAB, (3.2) recruitment of industry representatives, (3.3) PAB meetings, and (3.4) contributions to program development.

3.1 The aim and tasks of the PAB

At Chalmers University of Technology, the purpose of the PAB is expressed as follows: “The program advisory board shall primarily work for the strategic issues and quality development of the education. The board is to be consulted on important issues concerning planning, content, implementation and results of education” (Chalmers University of Technology, Decision number: C2011 / 426). All heads of program (HP) state that the PAB is important or very important in giving advice on the curriculum's content in order to meet the business’ needs. On the other hand, HP express varying opinions about whether goals are clear, and the PAB’s mission is well-rooted with the members of the board. The majority of HPs who have had their assignment for a long time express a clearer picture of the purpose than those who are newer in their role.

3.2 Recruitment of industry representatives

The composition of the PAB follows the HP's ordinance, which means that when appointing a new head of program, new PAB members shall be appointed by the HP. Many HPs state that the election of industry representative members has been made on the basis of personal contacts, often former
students from the program; “HP chooses members for them to be a sounding board for the education/students to fit with employers in the business sector. Alumni are important for connection and loyalty, but also experience from the program. A former member had extensive experience from Big Company, good as a complement to other members (who are alumni, authors' note)”.

3.3 PAB meetings

Prior to the program advisory board meetings, invitation and agenda, and in some cases preparatory material are sent to the PAB’s members. Several HPs send preparatory material before the meeting: "Invitation contains material for preparation". Another HP says: "No, not in addition to the agenda where the topics are described". Some HPs provide other explanations to why the scope of preparatory material is limited or completely excluded: "industry representatives do not read too much material". During most PAB meetings, notes are taken and are subsequently published in the university document management system. Most of the time, these notes are sent to the members of the PAB after the meeting, via email. Single HP describes that meeting notes are not taken.

HPs interviewed express slightly different set-ups of PAB meetings and the use of meeting time (1.5-3 hours). Information about the program, such as admission scores, student performance and course evaluation results are presented by the HP. Almost all HPs estimate time used for this is to approximately 40 percent of the entire meeting time. Some HP set aside time during meetings for round-table presentations where members are given the opportunity to highlight and discuss, for them, important issues. Others limit individuals' opportunities for presentation to occasions when a new member is introduced into the PAB.

Discussions during meetings are usually held in a whole-group-setting. Some HP express that such discussions can be dominated by specific individuals. These individuals are sometimes teachers with a great interest in the subject matter, and sometimes industry representatives with long experience. One HP says: "Yes, sometimes it happens that someone takes up too much space. Often teachers who are involved in a particular question. In these cases, I try to steer the discussion so that time can be balanced between different members in relation to total time space". Another HP states: "When the board included an experienced industry representative, he took a lot of room in discussion, often with the argument "this is how it is". This could be perceived as if he took over discussions but, his comments were most often clever, thanks to his long experience".

Both meeting frequency and format vary depending on whether the education program is facing major changes or is in more of a steady state. Most programs conduct two to four program advisory board meetings annually. When programs face extensive program development or concrete development projects, for example when program plans are being redesigned, several HPs express that they benefit from program advisory board contributions. Workshop formats are then used to generate and develop ideas as well as to receive arguments in order to be able to anchor ideas and decisions within the executive management team for education at university, with course-providing departments and with program students. During these periods, HPs express that program advisory board meetings and industry representatives' contributions are of greater importance, which leads to a higher frequency of meetings (three to six times a year).

During steady state situations, a lower need for program advisory board meetings is expressed, and meetings are held less often (one to three times a year). Meeting format and content can be characterized as presentations, follow-up and information transfer from HP to board members. One HP stated: “When project XX was ongoing, meetings, in work groups, were more frequent. Now when that major development project has been completed, and we are in an implementation phase, we only meet during regular board meetings once per term. I believe that this is sufficient.”

3.4 Contributions to program development

Heads of program describes that they consider the needs, wishes and suggestions of the industry representatives with regards to program development. However, HPs also express limitations originating in university rules and regulations. One HP states: “We listen to them, but we cannot do as they (authors' note: the industry representatives) want, since we have rules and regulations (authors' note: the university quality assurance system) to adhere to’.

The HPs use the advisory board and its industry representatives as a sounding board to receive views and reactions to suggestions brought forward during meetings. Since HPs perceive that comments, recommendations, and suggestions from the board are put in high regard by the university executive
committee for education, an approval by the board provides legitimacy for changes. One HP also express a need of board approval for changes as: “For the university this is necessary. We must show that we have some sort of a backbone here”.

4 DISCUSSION

4.1 Aim and purpose

In the university-common guidelines regarding program advisory boards (Chalmers University of Technology, Ref. C2011/426) it is stated that the boards should address strategic issues and quality development, plus that they should be heard on issues related to planning, content, execution and output. Interviews show that HPs interpretations of board purpose and tasks vary a lot. This does, in turn, lead to variations in the industry representatives’ possibilities to contribute to program development of each program. The wording in governing documents means at the same time that HPs are free to design tasks and work forms in line with the program needs.

4.2 Recruitment of industry representatives

This study show that selections of advisory board members mainly are made based on personal connections, and that it is primarily alumni that are prompted. Genheimer and Shehab [3] establish that the strength of connections between industry representatives and the university, and the proportion of industry representatives in a board, are significantly related to the participation of industry representatives in board meetings and how strongly they advocate their program.

Thus, with alumni in the advisory board conditions for high presence and engagement during meetings, and strong advocates for the program outside of the university. At the same time, this can create a risk for conservatism within advisory boards’ program development activities, since many board members will have similar references and experiences from the same university.

4.3 Program advisory board meetings

Program advisory board meeting have been shown to contain elements of strategic, as well as more informative, character, and the informative elements most often constitute a large part of meetings. This means that the space for discussions on strategic issues during which industry representatives can contribute, are limited, Meetings are most often performed as plenary sessions. This combined with that specific individuals dominate the speaking space during meetings (which is mentioned by certain HPs), put further limitations on industry representatives’ contributions.

Emmer and Abdallah Ghanem [5] highlight a general need for regular meetings between faculty and industry representatives, and that this is particularly important in questions regarding program content. Our study shows that board meetings are held with irregular frequency and in different ways, and that this differs depending on whether the program is perceived as being in a development phase of more of a steady-state phase. Coe [9] brands advisory boards that meet no more than 1 to 2 times per year, “passive” (in comparison to “active advisory boards” which meet more often and perform a broader spectrum of joint activities). According to HPs, low meeting frequencies are common in steady-state development phases. With low meeting frequencies, the risk for passive advisory boards and few contributions from all board members, decreases.

4.4 Contributions to program development

Several of the HPs indicate that they perceive that it is important for central functions within the university that advisory board meetings are held. They mean that program advisory board meetings create legitimacy for initiating changes, and for putting demands on departments delivering courses to the education programs. At the same time HPs express that they cannot oblige all suggestions from industry representatives, due to a perceived inertia regarding execution of course and program development decisions. Genheimer and Shehab [3] claim that effective program advisory boards display clear understanding of boards’ role and their limited influence. If board members are misled regarding their influence, this can have a negative effect on their motivation to contribute. This means that industry representatives contribute to the legitimacy of program development activities by participating in board meetings, and that it is important to make the industry representatives aware of the true impact that their contributions might have.
5 CONCLUSIONS

The main conclusions from this study are the following:

- Possibilities for industry representatives to contribute to program development varies to a large extent among the program advisory boards at Chalmers University of Technology. This depends on formulations in governing documents, as well as the need for advice experienced by heads of program.

- Possibilities for board members to contribute can be limited by the meeting format, at the same time as the format can result in passivity. Frequency and format vary among the boards at the university.

- Possibilities to make use of the industry representatives’ contributions are perceived as limited due to inertia in the execution of course- and program development. At the same time, advisory boards create legitimacy to program development activities.

Future studies regarding industry representatives and their contributions, and program advisory boards’ functions, are recommended.

ACKNOWLEDGEMENTS

The authors would like to show great appreciation to all participants in this study for their time and involvement.

REFERENCES


